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Radio Control CAR ACTION

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COVER: Schumacher's
new Storm dominates
this month's cover.
(Photo by John Huber.)
Upper right—mural-
painting techniques.
(Photo by Mike Ogle.)

EDITORIAL

by FRANK MASI

GET INVOLVED!

The boom is over. We can all see that. Generally, the R/C hobby has stabilized, and the industry is looking for ways to ensure its growth and prosperity. New blood must be infused—but how? The answer is newcomers—those first-time buyers who stroll into local hobby shops in search of recreation. How can we get these people “hooked” on R/C? How can we make sure that their initial experiences will be positive ones? We can’t. But what we can do is be as helpful as possible to them at the track. Offer encouragement, not criticism. Don’t make fun of the kid with the entry-level car—we were all there once, remember?

If you’re a hobby-shop owner, get involved. Don’t just sell the kits, demon-



Trinity spends a lot of time and money promoting its Speedworks race series. It offers drivers a racing forum in which all begin as equals, i.e., with the same motors and batteries, and the best driver wins. These events also include seminars at which local drivers can quiz the pros. Here, Ernie Provetti and Joel Johnson present a young racer with a new motor.

strate them. If there’s no track near your shop, go to the local shopping mall and set up a small course to put R/C cars in the public eye—not inside a showcase.

Here’s what to do: make a temporary barrier with 2x4s, and set up a simple track in your parking lot on a Saturday or Sunday morning. Get some of the local drivers who frequent your shop to come drive around the course. I guarantee that you’ll attract interested onlookers (also known as “potential customers”). Some of these people may be interested enough to ask questions, so make sure that you’re available to answer them. Emphasize

entry-level kits (today’s entry-level is the equivalent of yesterday’s state-of-the-art). The fact that R/C car racing is the one activity that parents and kids can enjoy together is also a powerful selling point.

If you also operate a racetrack, why not consider starting a spec class for new drivers? Set monetary limits on the components the racers can use (motors, battery packs, etc.). Regulating such a class to a particular brand creates its own problems, so try to avoid this. Above all, keep the attitude positive. Offer your newcomers words of encouragement and, if possible, make sure that your regulars do so as well. Nothing will dampen a new racer’s spirit more quickly than a snooty attitude from more experienced drivers, who should be acting as role models—not antagonists! With luck, these new enthusiasts will stick with the hobby, and that will only help your business.

As a hobby shop owner, you’re not alone. Your distributors are behind you—it’s in their best interest if your business grows, after all—and magazines like *Car Action* can help by featuring the products that you sell, and by providing readers with the most informative articles in the business. Remember, no one is asking you to do it all, but it all begins at the hobby shop level; that’s where people are first exposed to R/C, so make it appealing.

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LETTERS

WRITE TO US! We welcome your comments and suggestions. Letters should be addressed to "Letters," Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

SPEAKING OF BRAIN-DEAD...

I look forward to reading your mag every month—totally fly! Regarding the letter written by K.P. Hunter in the June '92 issue—about "i.e." and "e.g."—thank the Lord you put it in there! I had no idea what "i.e." and "e.g." meant! I even showed the magazine to my English teacher, Kooms (better known as Bundles), but he had no idea what they meant, either. He told me that the people who write this magazine must be brain-dead drips, but please don't be offended, 'cause Teach Bundles is a total 'tard. I mean, get this: he thinks he's reincarnated and that, in his former life, he was a duck!

By the way, are there any upcoming reviews on the Flitecraft airboats? Thanks for all the fun!

CLINT TROXEL
Bluffton, IN

Clint, pass this on to your professor: yo, teach. Let me get this straight: you're an English teacher who doesn't know what "i.e." and "e.g." mean, but you think that we're brain-dead drips. Methinks you should seriously consider changing professions. A fine example you're setting for your students—you ought to be ashamed!

Clint, I spoke with Gerry Yarrish, editor of Radio Control Boat Modeler and illustrator extraordinaire, about Flitecraft airboats. He says that you should look for a review in an upcoming issue.

LA

LOOKING FOR MISTER GASCAR

I'm glad that you've dedicated more of your mag to nitro racing and gas car/truck "Track Reports," and I really like the new

column, "Nitro News." I'm looking for a .12-size 4WD gas car. I know about the Stinger MK II, but it's getting old. Will Kyosho offer an upgraded model? If not, which cars do you suggest I try? I love your mag—too bad it doesn't come out weekly.

ERIC GUNDERSON
Alpena, MI

Eric, you're obviously a person with exceptional taste. I'm glad that you like "Nitro News," and I promise that there's much more info on gas cars to come.

Several new gas cars will be released in the next few months. Although the Stinger isn't slated for a "Turbo" version any time soon, I have it on good authority that Schumacher plans to release a 4WD version of the Nitro 10, and it will be equipped with an Irvine .15. Also, look for Kyosho's hot, new, 1/10-scale truck—the Nitro Thrasher. This 4WD beast will be powered by an O.S. CZ-R .12. OFNA will soon introduce a 1/10-scale version of its popular 1/8-scale Pirate M1. This shaft-driven 4WD "Mini-Pirate" racer will be powered by the potent O.S. CZ-R .12. Take your pick; they all sound hot to me! Watch for reviews—coming soon to a Car Action near you.

JB

Errata

In the June edition of "Inside Scoop," we printed Victor Engineering's street address incorrectly. It should be 1000 Calle Cordillera, San Clemente, CA 92672; (714) 366-2931; fax (714) 366-2385. We apologize for any inconvenience!

Errata, Part II

We printed an incorrect address in the June '92 edition of "What's New." For more information on the Sanyo 1500 SC 6-cell pack, please contact Hobby Dynamics, 4105 Fieldstone, Champaign, IL 61821.

BREAKIN' AND ENTERIN'

I had a few questions about the March '92 "Nitro News" column that was subtitled "Breaking and Entering."

1. You say that a new engine should be run on a rich setting for a few tanks of fuel. Does this mean that I should let the engine run at idle at this rich setting?

2. How hot is too hot? Should the engine be fairly hot or just warm to the touch? Is there a normal operating temperature for O.S. or Rex engines? Are there any temperature gauges on the market?

3. When running the car at the track, you said that it's best to let the engine cool down between tanks. Should I let the car idle between fill-ups, or should I cut the engine?

I love your magazine, and I hope to see more articles like this. Beginners like me can use the help. Thanks.

RUDY KALANDROS
San Francisco, CA

Rudy, there are several ways to break-in a new engine, but the one outlined in "Nitro News" is the safest and most widely accepted.

1. Don't let the car sit at idle when you break-in the engine. It's important to get the car on the track so that air will move over the heat sink and keep the engine cool. Vary the speed as you drive, and avoid running the car at full throttle for extended periods.

2. You have to get the engine up to operating temperature, but don't allow it to overheat. Although there are sophisticated, expensive pyrometers that can be used to measure the cylinder head's temperature, this simple "spit" test works just as well: if the engine is operating at the proper temperature, the saliva should "slowly" boil off the head in 2 or 3 seconds—no less!

3. When you break-in the engine, shut it down between tanks to let it cool. If you run it through more than one full tank, heat will continue to build up in the engine, and it will pass through its case to

(Continued on page 10)

Andy's

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LETTERS

(Continued from page 9)

the engine mounts and maybe even into the chassis. After you've broken-in the engine, you can drive your wheels off, as long as you check the temperature during fill-ups. Keep on cruisin', kid! JB

CLOD CONTROL

I recently received a secondhand Clod Buster, and I rebuilt it. It's completely stock except for the Trinity Matched Madness motors. I have two Novak T-4 speed controllers. Can I run both of them off the same channel so that each will control its own motor? The people at my local hobby shop say no, but a friend of mine, who has no concern for my equipment, wants to try it now. I'm short of cash and can't risk frying my controllers or my receiver. I use a Futaba Magnum Sport radio, and I plan to run two D-size 6-cell packs on each controller. Any assistance you can provide will be welcomed.

I'd also like to say goodbye to Steve Pond. I enjoyed reading his articles, and I'm sorry to see him go. Good luck, and thanks, Steve.

MICHAEL J. SEMANIUK
Hartford, CT

Michael, just connect the two speed controllers to the receiver using a Y-connector for the receiver plugs. This will let you operate both controllers from the same channel on your radio. If you plan to use only six cells for each controller, connect each unit's two red voltage-regulator bypass wires—to each other, not to those on the other controller! This will bypass the controllers' internal voltage regulators. AS

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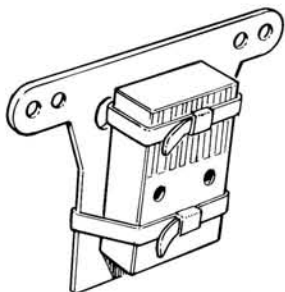
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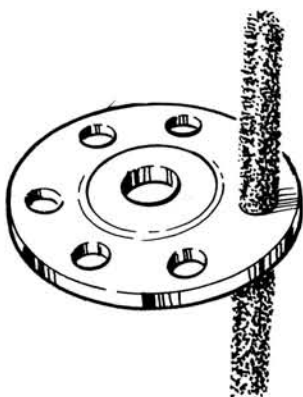
by JIM NEWMAN



QUICK-CHANGE ESC

Why not use tie-wraps instead of servo tape to attach an ESC to your RC10's rear shock tower? The unit will be held in place securely, yet you'll be able to remove it quickly. This tip will work on other cars, too.

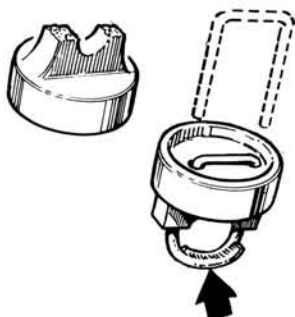
Brian Kearney, Glendale, CA



BALL-DIFF CLEANER

Clean out the holes in the spur gear using pipe cleaners that have been sprayed with motor cleaner or any other good solvent. This cleaning method is quick and efficient.

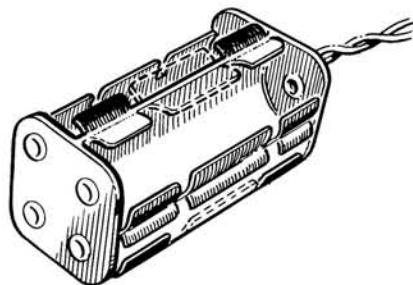
Myron Ware, Newport News, VA



SHOCK-LUG REPAIR

This easy "fix" is very durable. Smooth the broken lug's edges with a fine file, and then drill holes through it as shown. Bend a large paper clip into a square "U," and insert it in the holes from the inside of the cap. Join the ends of the clip and solder them together.

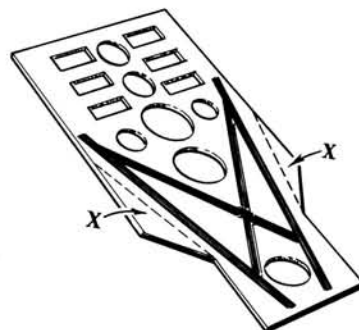
Gregory Wauben, Cumberland, IN



E-Z BATTERY REMOVAL

Just trim the "ears" off a Futaba battery holder, and you'll find it easier to remove your Ni-Cd cells, yet they'll still be held in place with a vise-like grip. This will work on other brands of battery holder, too.

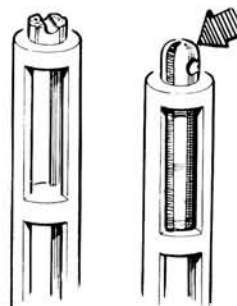
Mike Rommel, Prince George, British Columbia, Canada



CHASSIS IMPROVEMENT

Here's a way to stiffen your RC10L's fiberglass chassis and reduce its weight by up to 1/2 ounce! Use CA or epoxy to glue 1/4-inch-wide, carbon-fiber capstrips (available in the airplane section of your hobby shop) to the top and bottom of the chassis. Then cut out large holes as shown, and cut off the areas marked (X). The carbon-fiber reinforcements enable you to remove excess material without weakening the chassis.

Larry Renger, Cerritos, CA



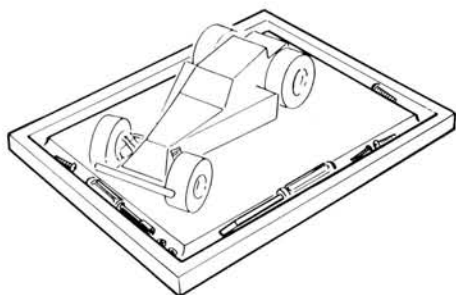
BLACKFOOT BODY-MOUNT REPAIR

Carefully file the broken stub flush with the top of the body mount. Drill a 5/32-inch-diameter hole down through the center of the mount, and use CA or epoxy to glue a 5/32-inch-diameter aluminum or brass rod of the proper length (see arrow) in place. Drill a body-clip hole into the rod, and then carefully round the rod's top. For best results, scuff up the rod with coarse sandpaper or a file before you glue it.

Jeff Wacker, Leavenworth, KS

PLEASE NOTE: be sure to print your name and complete address clearly on each letter and sketch that you send to "Pit Tips." We've had to throw away many good tips because we didn't have the sender's name or address.

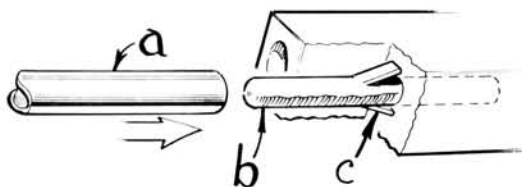
PIT TIPS



CUTTING BOARD/WORK TABLE

This 1/2-inch-thick, white, plastic carving board is sold in the kitchenware section of most department stores for \$10 to \$12. One side of it makes a great cutting surface, and the other has a deep trough along its edges that prevents small tools and stray nuts and bolts from rolling off. The white surface reflects a lot of light into the dark depths of your car, too.

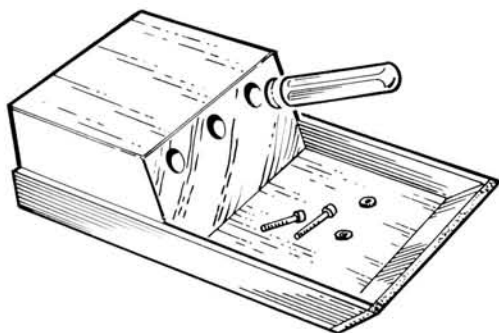
James Borsenik, Elyria, OH



CONNECTOR-PIN REMOVAL

Slide a piece of brass tube (a) over the pin (b) and push it firmly into the connector to collapse the barbs (c). To extract the pin from the connector, just tug on the wire.

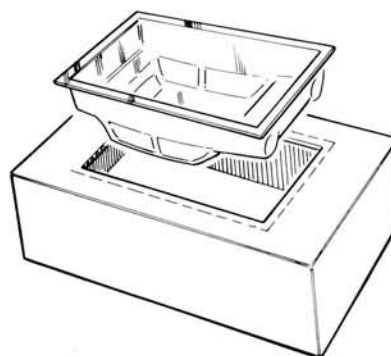
Hilary Gierman, Columbus, NJ



SCREWDRIVER PIT MATE

Made of a piece of 2x4 pine and some plywood scraps, this neat gadget keeps your screwdrivers handy and prevents screws from being lost during rushed pit stops. Make as many holes as you need.

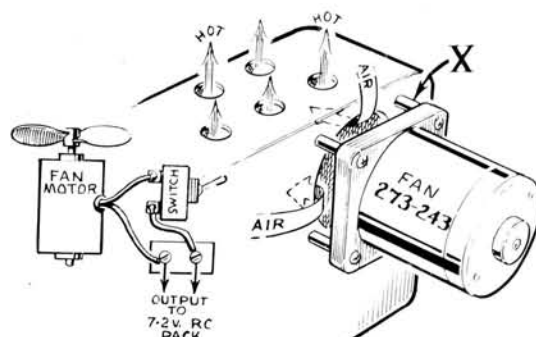
David Hammond, Charlton, MA



BOXY PAINT SHIELD

Cut the hole in the box so that the body shell will fit in it snugly. Secure the body with a few strips of tape. Mask the interior of the shell as desired, and spray-paint away! The box will keep unsightly overspray off the exterior of the body.

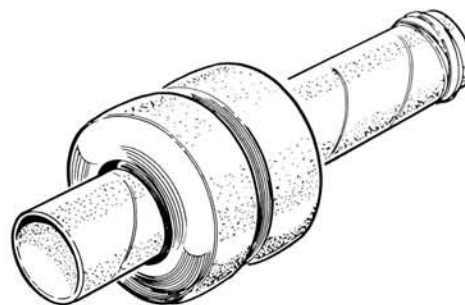
Steve Wolf, Lagrange, IN



FAN-COOLED CHARGER

Most fans operate on 120 volts AC, but this Radio Shack fan only needs 12 volts DC. To mount it on the charger, drill the holes as shown. To position the fan close to the opening and allow it to draw cool air in from outside, attach 5/16-inch-long tubular standoffs (X) to it.

Adam Grant, Cranston, RI



TIRE CADDY

A cardboard paper-towel tube makes a very tidy tire caddy. To prevent the tires from sliding off, wrap rubber bands around the ends of the tube.

Gabriel Fanelli, Philadelphia, PA

Radio Control Car Action will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send rough sketch to Jim Newman, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.

INSIDE SCOOP

by CHRIS CHIANELLI



get all the late-breaking news before those other "fish-wrap" rags—revenge is mine! Anyway, I work for El Commandante, and we all work for you. So many scoops, so little time....



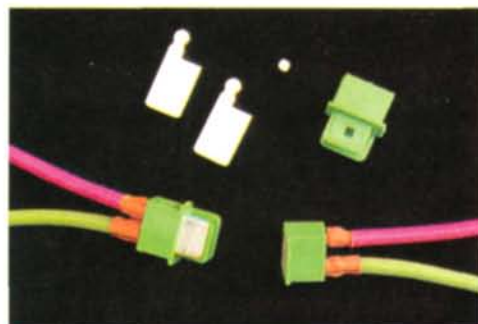
Novak's M1

Novak's new 410-M1 ESC is essentially an M1c without the torque-limiting feature, but it incorporates the same state-of-the-art surface-mount technology used in other Novak units. The M1 will be priced between the budget 410-M5 and the 410-M1c.



It's gas-off time again

When: August 21, 22 and 23, 1992; where: Detroit, MI, at the SEMROCC Worlds track. It's time for the 3rd Annual Kyosho 1/8-Scale Gas Off-Road World Challenge, co-sponsored by Car Action, of course! Which car will take the blue ribbon this year? Will it be the Pirate M-1? Or could it be the Kyosho Inferno? Last year, Cliff Lett took 1st driving an M-1 and Joel "Playboy" Johnson took 2nd with his Turbo Burns (despite some engine trouble). Unfortunately, according to some reports we've heard, Cliff will be unable to attend the race. Don't worry, though, Joel will be there driving the latest Kyosho Inferno and easygoing Jammin' Jay Halsey will pilot an M-1. If you want to see nitro action live, it's the only place to be. There will be two classes: 1/8-scale buggies (30-minute A-Main) and 1/10-scale gas stadium trucks (.12-size engine limit, 15-minute mains). Be there, get gassed and have a blast. Shut up!



RACE PREP PRO 2 CONNECTORS

Race Prep, a leader in high-performance connectors, has again improved the design. Not only does the Pro 2 have protection against reverse-polarity connections, but it also has a nylon ball between the plates to ensure extra contacting pressure for greater conductivity and longer life.



LETHAL WEAPON TOO?

King Cab owners, rejoice! For a very long time, it has been no secret that the weakest link in the Tamiya King Cab is the gearbox. Now, "cabbers" can reap performance and durability benefits from A&L's super-silky, belt-driven ball-diff tranny. The included slipper clutch gets the power to the ground smoothly under hard acceleration.



In a glitch-free galaxy

This is NASA's prototype planetary rover—Rocky III. Designed for use on the moon or on Mars, this R/C vehicle measures 24x20x19 inches. The amazing little Rocky III can travel over rough terrain and collect soil samples with its mechanical arm. There's one glitch, though: depending on the position of the planets, a controller on earth would have to contend with radio-transmission delays of anywhere from 5 to 40 minutes to reach the rover on Mars. This would present a problem if Rocky III were headed for a cliff. A free *Car Action* subscription goes to Paul E. Shirley of Wedowee, AL, who provided this scoop.

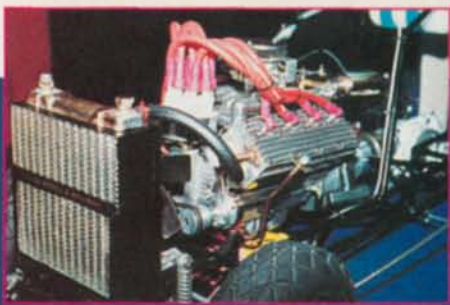
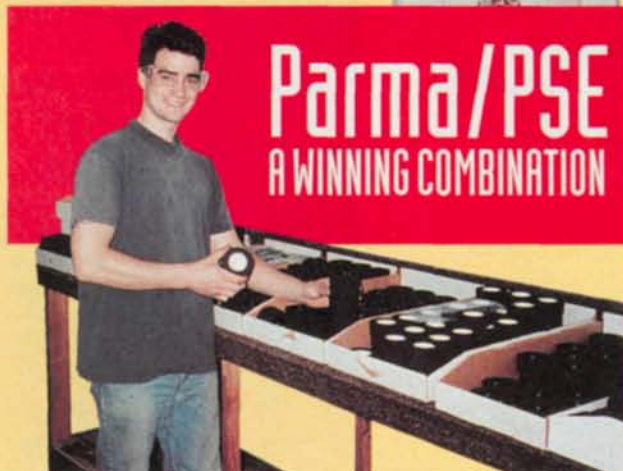
Half-Track Attack



Here's an example of Japanese scratch-building ingenuity. This 1/8-scale hand-made German half-track was made in both gas (27.5 pounds) and electric (22 pounds) versions. They're equipped with the same machined-aluminum gearbox (left, with the electric motor attached), which has two forward and one reverse speeds. The .30 glow-powered version (center) has an electric starter, a one-way clutch system and a ducted-fan cooling system. The cooling system's impeller is shown top right. If there's anyone working on anything like this in the States, please let me know!

INSIDE SCOOP

Parma International is now the exclusive distributor of PSE performance products. PSE, which is known for its high-quality line of on-road wheels and tires, has extended its product line to include solid titanium axles, lightweight aluminum racing hubs for 1/10- and 1/12-scale cars, ceramic diffs, titanium dogbones and titanium-coated lightweight pinion gears. Mike Houge (right) is the designer of PSE products; the combination of his expertise and Parma's powerful distribution network should be a winner!



quarter-scale FLAT HEAD

Custom Model & Machining of Tualatin, OR, has produced this 6.3ci (103cc) displacement model of a '53 Ford flat head called the "Challenger V8." The Challenger, which is made mostly of aluminum, cast-iron, steel and brass, is rated at 5hp at 6,000rpm and reportedly idles at 1,000rpm. The 10-pound, 1/4-scale V8 features a spark ignition, water-cooling, an internal oil pump and a Walbro carburetor. For more info, contact Custom Models & Machining, 20805 SW 90th Ave., Tualatin, OR 97062-9334; (503) 692-1093 or 649-3554.

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"Readers' Rides" is our way of recognizing the unique, innovative—and sometimes bizarre!—vehicles that our readers have created. Send us a sharp, uncluttered, well-exposed color photo of your car or truck (no Polaroids, please!), along with a brief description, to Readers' Rides, R/C Car Action, 251 Danbury Rd., Wilton, CT 06897. If the Ayatollah chooses your photo, you'll receive a one-year subscription to Car Action, or an extension to your existing subscription. You'll also be eligible for the third annual "Reader's Ride of the Year Contest" in the fall of 1992. Write your address and phone number on your letter and on the back of each photo you send, in case we need to contact you.



PIEPER HYPER

Jeff Pieper of Strasburg, IL, is into concrete-oval racing in a big way; just check out his Hyper 10! For better aerodynamics on the high banks of Ameri-Trac (one of Car Action's Top 10 Tracks), Jeff covered his chassis with MonoKote. He also machined a new rear shock mount, outfitted the car with Novak electronics and topped it off with—what else?—a Dale Earnhardt Chevy Lumina body.

STARS, STRIPES AND SPEED

This patriotic pounder belongs to Senior Chief Petty Officer Jerry Whitmore who's stationed at the Top Gun school in Miramar, CA. Under the Dahm's Jeep Cherokee ST body is an RC10T equipped with a Novak 410 M1c speed controller, a Slot Machine motor and a Futaba Radio. Jerry had never used an airbrush before he painted this body; it looks pretty good, but a set of Car Action decals would make it better. They're on their way, Jerry!



DO YOU TAKE IT TO THE VET?

Mike Romano of Delran, NJ, is the proud owner of this colorful King Cab. He wanted speed and great looks, so he equipped it with a Bud's 17-turn motor and a Novak 410 M5 ESC; then he added CCP chrome suspension arms and rod ends, Sees aluminum rims and a Motion Graphics body. According to Mike, the truck is "geared to run like a scolded dog." Whatever you say, Mike.



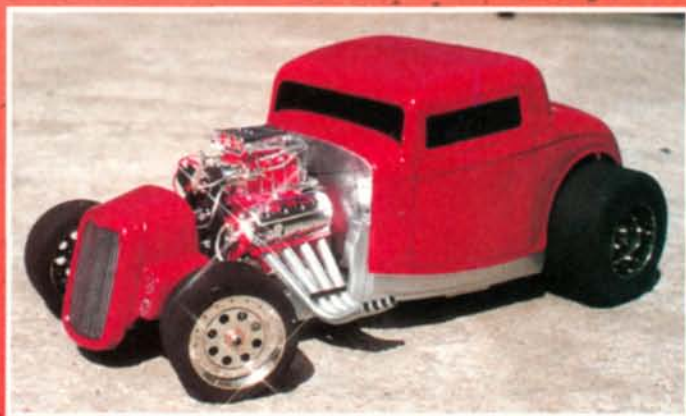


■ HEY! WHAT'S THAT SMELL?

Asif Mian of Mahwah, NJ, has created the world's first R/C garbage collector. Asif found the garbage-truck body in his basement and he repainted it, detailed the interior and added a driver. He mounted the body on his Traxxas Hawk and modified the chassis with a Monster Mash motor, a 7-cell SCR pack, a Tekin 408S ESC and Pro-Line Street Paw tires. Watch out on trash day when the "Garbage Gobbler" comes around!

■ TRICK TURBO

Juan Carlos Sala Pizzini of Lima, Peru, sent us this pool-side photo of his trick Turbo Burns. He modified it with a five-port Turbo Rex motor, a special clutch, a lightweight flywheel, a Rex header and manifold, a front-brake kit and torsion diffs. Juan uses an Airtronics radio to control this turbo terror.



■ PARMA HEMI HEAVEN

When it comes to making a street rod look great, Wayne Gregory of Brooklyn, NY, is the man. Wayne outfitted his Parma Hemi Coupe with Futaba radio gear and a Trinity Slot Machine motor, but what really makes it stand out is its exterior. Wayne painted the body with Pactra's Candy Red, and he polished the chrome parts to a brilliant shine. For his hot-rod effort, Wayne gets a free subscription.

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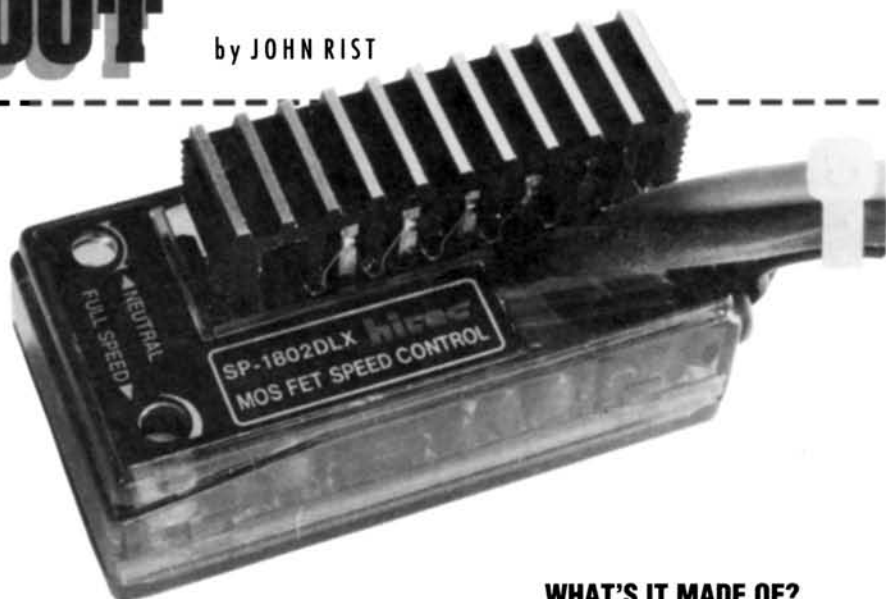
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SCOPING OUT

by JOHN RIST

MANY OF YOU have tight budgets, yet you still have the need for speed—a need that motivates you to look for trick parts. If you're still using a cranky, hard-to-adjust, power-robbing mechanical speed controller, maybe you should investigate the Hitec* SP-1802DL electronic speed controller (ESC). It costs less than a mechanical controller and a servo, and it also weighs less and gets better battery "mileage."

A couple of months ago, "Scoping Out" tested Hitec's SP-1802N and determined that it was a good controller. The 2DL looks identical to the 2N, and although it costs slightly more, it has a



higher current rating—a good indication that it will perform better. It's time to test the 2DL in the "Scoping Out" lab.

• SCOPING OUT LAB •

THE LAB consists of:

- an oscilloscope
- a digital voltmeter
- a variable-load resistor bank
- a 6V 30A electricity supply
- a Pit Stop Radio servo/speed controller tester.

The oscilloscope is used to monitor the controller's output and to guarantee that it's fully on.

The digital voltmeter takes all the voltage-drop readings and verifies the reading on the current meter.

The resistor load bank consists of 40, 12-ohm, 5W power resistors that can be switched on and off one at a time to vary the load between 6 amps and 20 amps, but the standard 12 amps are usually used.

In series with the resistors is a 25A Simpson current meter and a 1-percent 0.01-ohm resistor. By measuring the voltage drop across this resistor, the current-meter's reading can be double-checked. Of course, the lab power supply provides the test current.

• **VOLTAGE-DROP TESTS.** These are the first tests. It's virtually impossible to read an ESC's resistance directly, so I measure the voltage drop across it with the resistor bank set up for 12 amps of current. I then calculate the controller's "on" resistance by dividing the measured voltage drop by 12 amps. I take the voltage reading twice: along the full length of the battery and motor wires (including connectors) and 2 inches along them. The first reading helps me to determine an ESC's "on" resistance as it comes from the factory, and the second gives a standard reading with which I compare ESCs.

• **LET-IT-COOK TEST.** I adjust the resistor bank to pass 20 amps of current, then I jam the throttle wide open and let the ESC pump the 20 amps.

• **DEAD-SHORT TEST.** With this test, I check whether the controller can survive the heavy current caused by a jammed gear or a fried motor. No one likes to have this kind of trouble and discover that his ESC has been destroyed, too.

WHAT'S IT MADE OF?

When I first examined the unit, I thought that Hitec had accidentally sent me another 2N, but a look under the heat sink reassured me that this was the 2DL. The FETs used in the two controllers are different: the 2N has plastic-insulated tab FETs; the 2DL has metal-tab FETs. At first, I was worried that when I installed the metal heat sink it would cause a short between the five motor-drive FETs and the brake FET. Apparently, the people at Hitec had the same concerns, and they took steps to prevent this. The brake FET's tab is insulated (as are all those on the 2N), so you can install the heat sink across all the FETs without causing a short.

Speaking of the heat sink, when you remove it, be careful not to lose the brass leaf-spring inserts. They improve the connection between the sink and the FETs and, although they're held firmly in place when the sink is installed, they can fall out when it's removed.

The 2DL comes with servo-mounting tape, an adjustment screwdriver and an instruction sheet. The screwdriver is one of the best I've ever seen shipped with a controller, but the instruction sheet is a different story. If you don't know where and how to use this super-fine screwdriver, don't expect the instructions to help you out. Although the picture labeled "connection" is good, the written

SUBSCRIBE

instructions are vague and might confuse newcomers.

You don't have to remove the 2DL from its case to inspect the internal workmanship, because the case is made of clear plastic. The 2DL uses conventional parts, and all the leads pass through a high-quality printed-circuit board. The etch under the FETs is very heavy, and all the solder joints are shiny and smooth.

The 2DL is a racing-style, forward-only controller with the following features:

- Six FETs (five for forward; one for brakes);
- Factory-installed Tamiya-style battery connectors, bullet-style motor connectors and a Futaba-J-style receiver connector;
- Adjustments for neutral and full speed;
- An on/off switch.

All this is well and good, but can the controller put out the power? To find out, I headed for the "Scoping Out" lab with the SP-1802DL in hand.

LAB LABORS

Before I can test a controller, I must install it in my workbench test setup. Hooking up the 2DL is easy owing to the factory-installed connectors and the connection picture in the instructions. Adjusting this ESC, however, may be difficult for newcomers. It has two adjustment potentiometers (pots)—one for neutral; one for full speed—but it doesn't have a built-in pulse-checker LED.

I set the throttle trim on my Futaba Magnum AM radio to zero (center of its travel). Then I checked that the high and low ATV (adjustable travel volume) adjustments on the transmitter were set at 10 (maximum). Not all transmitters have these controls, because they're only important when you try to match a throttle servo to a mechanical controller. Setting the end points to max gives an ESC the

(Continued on page 26)

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SCOPING OUT

widest possible pulse and improves the chance of achieving full speed.

After making these adjustments, I turned everything on. (Always turn on transmitter and then the receiver and the controller.) I adjusted the neutral pot by turning it until the controller pumped just a little current, i.e., the motor ran very slowly. Then I eased the neutral pot back till the motor stopped.

I advanced the throttle slowly, and I noticed that the SP-1802DL reached full speed (max current in my test setup) at about the 80-percent throttle setting. (If the ESC is attached to a motor, you can listen for a change in the motor speed. It should be turning max at about the 80-percent trigger point; throttle changes between that point and max shouldn't affect the motor speed.)

Finally, I fine-tuned the neutral setting using the transmitter throttle trim. (If you can't find a satisfactory neutral trim, readjust the 2DL's neutral pot.) It was time for the tests.

VOLTAGE-DROP TESTS

I always check the resistance first. The voltage drop along the length of the wires was 0.21 volt, which yields a resistance of 0.0175 ohm. Two inches along the wires, the voltage drop was 0.09 volt—a resistance of 0.0075 ohm. This resistance indicates that the Tamiya-style battery connectors, the bullet-style motor connectors and the long wires are extremely inefficient. If you plan to use the 2DL for racing, replace the battery connectors with Litespeed* connectors and hard-wire the motor.

LET-IT-COOK TEST

I jacked the current up to 20 amps, and I let the 2DL run for 15 minutes with the heat sink in place. (As usual, I didn't use a cooling fan.) At the end of the test, the 2DL was quite hot, but I wasn't burned when I touched the heat sink. Such heat is consistent with the "on" resistance that I had measured.

DEAD-SHORT TEST

I created a dead short by connecting the motor leads, and then I turned the 2DL on full bore. The current jumped to 40 amps (the limit of my lab supply), and I let the controller run this way for a minute. When I shut it down, the heat sink was hot enough to burn me. I let the 2DL cool; when I turned it on again, it operated normally.

ROAD TEST

After I had installed the 2DL in my Kyosho Sideways "Miss Piggy" car and charged several battery packs, I headed to a local parking lot. During the very first run, I discovered that the 2DL had more punch than its little brother, the 2N. Both the acceleration and the brakes were strong, and the run times were long—sometimes too long, in fact. I realized that I had geared the car in the 10-minute range so, after the first run, the heat sink was a little above room temperature.

To prepare for the second run, I installed a larger pinion in the car. This time, Miss Piggy ran for 6 minutes and the heat sink was barely warm. I didn't have time for a 4-minute run, but I'm sure that if I had pushed the 2DL harder, it would have been up to the task.

CONCLUSION

Hitec's SP-1802DL is a fairly strong ESC. It's quite small and narrow, so it should fit in most 1/10- or 1/12-scale cars. Its "on" resistance is low, and it remained cool during the tests. Also, the unit comes with a fantastic screwdriver.

On the down side, the instruction sheet needs improvements, and the unit doesn't have a built-in pulse checker. Also, the factory-installed connectors are inefficient. If you follow the procedures outlined in this article, however, you should be able to set up the 2DL properly.

The Hitec SP-1802DL is an affordable alternative to a mechanical controller. It also weighs less, runs cooler and, if it's installed properly, it should have more punch.

**Here are the addresses of the companies mentioned in this article:*

Hitec; distributed by RCD, 9419 Abraham Way, Santee, CA 92071.

Litespeed, P.O. Box 4765, Spokane, WA 99202. ■

HITEC SP-1802DL

DIMENSIONS:

Height	1.00 inch
Width	0.99 inch
Length	1.90 inches
Weight with wires	1.95 ounces

TUNING:

Access to controls	Good
Ease of adjustment	Fair

PRICE:

Price	\$79.95
Warranty	1 year

ELECTRICAL:

(Manufacturer's specs)

Max voltage	15 volts
Min voltage	6 volts

Max current	800 amps
Continuous current	175 amps
Resistance	0.01 ohm

TEST PARAMETERS:

Voltage	6 volts
Current	12 amps
Voltage drop, end to end	0.21 volt
Voltage drop 2-inch point	0.09 volt
Resistance tend of wires*	0.0175 ohm
Resistance, 2-inch point*	0.0075 ohm
BEC voltage, 6-cell pack	5.47 volts

*Resistance = voltage drop / current

COMMENTS:

The rugged, affordable SP-1802DL is an excellent entry-level racing ESC that's the ideal replacement for the mechanical controllers in sport-model pan cars, buggies and trucks. The instructions are vague and confusing, but installing the controller is relatively easy owing to its factory-installed motor and battery connectors. (If you plan to race using this controller, however, it's best to replace these connectors.) In the road tests, the SP-1802DL provided brisk acceleration and plenty o' speed, and the heat sink became only slightly warm. All this adds up to a lot of fun for your R/C car dollar.





N I K K O

RA RA

IF LEFT unmonitored, those beautiful sun rays that playfully dance on ocean ripples and bring cheer to the human heart will also turn hu-

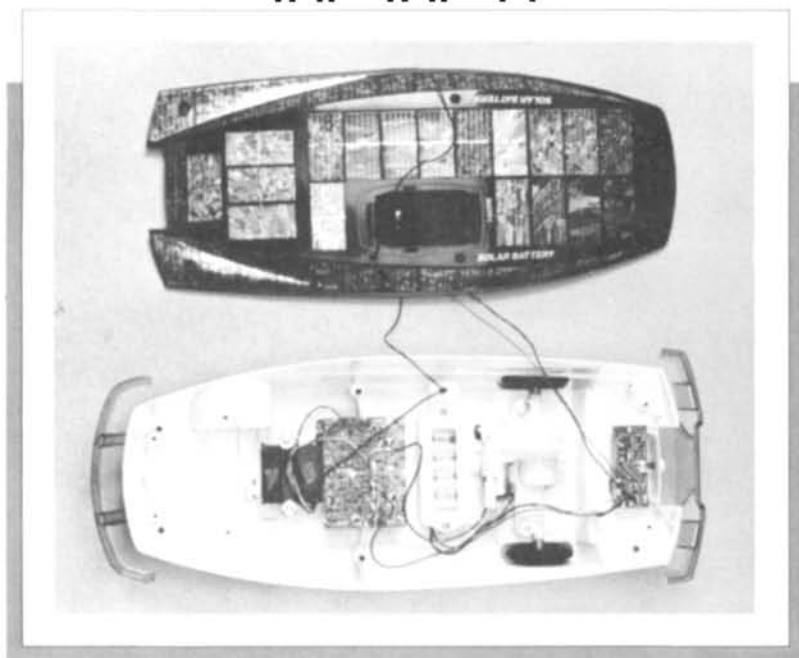
man skin into beef jerky in no time at all; obviously sunlight is a power source of awesome potential, which is only limited by creativity. For instance, by using the sun's energy and a small focal crystal (a magnifying glass), one could experience hours of entertainment playing Star Ship Commander by "phasering" those Romulan ants that have aggressively crossed over from the neutral zone into your backyard! Others, like the people at Nikko*, will develop an R/C

solar car that does what it's supposed to do—turn that sunny warmth we feel on our faces into forward motion.

Nikko seems to carve out a special place for itself by producing ready-to-run oddities like tank-treaded trucks and hydrofoils. While some of Nikko's off-beat creations may have had dubious appeal in the eyes of some, the Ra Ra II (aptly named after the Egyptian sun god Ra) is a 1/10-scale embodiment of what the future holds in both full-scale and model scenes. I guess it's appropriate that the thing looks like something George Jetson would drive.

by CHRIS CHIANELLI

Ra-Ra-11



Contents of the Ra Ra II's lower half from (left to right): steering servo, receiver/speed controller PC board, on-board 5-sub-cell battery pack, 270 Mabuchi powered trans-axle w/2-speed tranny and charging circuitry PC board at rear. All 18 photo-cells are in the top half.

SOLAR GUTS

Modeled after a full-scale Toyota solar car, the body of the Ra is basically a rolling tub with a top. The top contains the eighteen photo-electric cells that generate the juice, while the rest of the electronics are mounted in the the tub. At the front of the tub is the fully proportional steering servo; behind that is the receiver/speed-controller circuit board, followed by the five mini-cell packs and the charging circuit board in the rear. The charging circuitry allows you to bypass the photocells and charge the Ra with an AC charger so it can be run even when it's overcast. The model is suspended on mini coil springs in all four corners. Driven by a 270-size motor, the front suspension is independent, and the rear suspension is a live axle with a manually selectable two-speed transmission mounted to the axle. Suspension travel is about 1/2 inch at the rear and 1/4 inch at the front with no damping at either end. Don't worry: high-speed jumps aren't one of the design objectives of this rig.

PERFORMANCE

Performance? The low-friction (low-traction) tires tell the story: there isn't any performance, at least not in the sense that we usually talk about in *Car Action*. Let's

**YOU CAN RUN THE CAR IN
THE BRIGHT SUN
INDEFINITELY WITHOUT
FIRST CHARGING THE
ON-BOARD BATTERIES.**

face it: this car was designed to run around on smooth surfaces; you won't need high-traction tires. The two-speed tranny I mentioned selects either "H" (high) or "L" (low). In high, the car's speed can be characterized as moderately slow; in low, it's definitely slow. The "L" position does have a purpose: in this setting, you can run the car in the bright sun indefinitely without first charging the on-board batteries. In high, the car must first be charged by AC or by the photocells when you leave the car in the sun. So, back to the question of performance; the car is great at parallel parking! No, really—the proportional steering works really well.

The Nikko Ra Ra II wasn't designed as a race car, but rather as an R/C technological novelty, which has a place in the "Hall of Conversation Pieces." This 1/10-scale R/C model of things to come is reliable, well made and a lot of fun to operate. If you had several, you could have a Ra Ra race of your own. Think of how much fun it would be to nerf your opponent into the shade and watch his little red blinking charge light go dim! Now that's future action.

**Here's the address of the company mentioned in this article:*

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by FRANK MASI

FORMULA 1 MANIA is sweeping Japan, and it isn't limited to full-size auto racing; it has hit the R/C car society, too. The result?—detailed scale F1 models that are realistic right down to the inboard shocks and multi-level wings! With its new $1/8$ -scale Ferrari 643 F1, Kyosho* has taken the term "scale performance" to a new plateau. I guarantee that you've never seen an R/C car like this before. I'm an F1 fan and, from the moment I first laid eyes on it, I knew that I had to have this car.

F1 FEATURES

The 1/8-scale, gas-powered Ferrari 643 is a showcase of Kyosho's engineering and manufacturing prowess. The main, aluminum section of its two-piece chassis is mounted just behind the elaborate front suspension. The front section of the chassis, to which the suspension is attached, is made of flexible black fiberglass so it isn't easily damaged. If you ever need to replace it, however, you can just unbolt it from the aluminum portion without having to disassemble the entire car!

To improve the car's appearance (and, perhaps, its performance), a molded plastic "ground-effects" plate is secured to the aluminum section. This plate runs underneath the transmission and the rear suspension and exits just under the rear wing. On a full-size F1 car, this plate channels turbulent air beneath the chassis and out behind the car. I don't know whether the 1/8-scale plate does the same thing, but it looks great!

The technological highlight of any race car is usually its suspension, and the Ferrari 643 is no exception. It has front and rear metal-reinforced A-arms with replaceable ball links. To inhibit chassis roll, it uses a unique front sway bar that consists of a U-shaped wire with ball ends. Tie rods bridge the gap between the bar and the shock's rocker plates, which transfer suspension movement to the bar.

The front suspension uses a true double-wishbone system. The lower arms are bolted to the fiberglass chassis plate; the upper arms are attached to a molded upper deck that helps to stiffen the chassis. Its lower-arm mount uses a "crash-back" system with a spring that allows the arms to pivot rearward slightly and absorb shock.

The rear suspension, which is also a double-wishbone affair, is a scale replica of that used on full-size F1 cars. It has threaded travel limiters that allow you to equalize the amount of travel on the left and right sides.

The outer ends of the front and rear suspension arms are connected to molded hub carriers. To make the car seem even more realistic, Kyosho has included small brake disks and calipers for each hub carrier, and you can see them through the car's rims!

K Y O S H O



Ferrari

formula frenzy 643



A double-wishbone suspension with inboard, oil-filled shocks keep the Ferrari's tires glued to the track. Like its full-size counterpart, the 643 has a wing to keep the front end stable and improve handling.



Ferrari 643



To keep things cool, the 643 has an engine-driven fan that directs air over the cylinder head. A Trinity Ni-Cd pack powers the onboard radio system and the receiver.



All U.S. versions of the 643 have O.S. CZ-R .12 engines instead of the less powerful .10 engines that come with the Japanese versions. The CZ-R has a pull-start—no 12V starter required.

In true F1 fashion, the Kyosho Ferrari's front shocks are inboard, under the body. This keeps them out of the open air so that they don't cause wind resistance. Don't assume that performance was forsaken for scale appearance; these aluminum-bodied, oil-filled, coil-over shocks work as well as those found on off-road buggies. They're attached to the upper suspension plate and are actuated by rocker plates. Pushrods connect the rocker plates to the suspension arms.

The inboard rear shocks are mounted just behind the spur gear and the brake mechanism. Like the fronts, the rear shocks have aluminum bodies and are connected to the arms by pushrods and lever (rocker) plates.

THE SPEED WE NEED

Why can't I buy a new Honda Prelude with the VTEC (variable-valve timing) engine? Many hot, full-size, Japanese engines aren't available in the U.S. The same is true of many R/C performance parts. In the

case of the Ferrari F1, however, the folks at Kyosho recognized our love for speed, and they replaced the .10-size engine that the Ferrari was designed to use with the more powerful O.S. CZ-R .12. That's right, boys and girls, *we* get the hot engine this time! The CZ-R has a lightweight pull-start mechanism, so

you don't need to buy a 12V starter.

When you run a gas car, it's extremely important to keep the engine's cylinder head cool; it *must* receive air directly. Kyosho, however, didn't want the engine to stick up out of this scale car's body, so a cooling fan (it's powered by the engine)

was designed to "duct" air directly over the cylinder head—now that's cool!

How do you stop a speeding Ferrari 643 F1? With a disk-brake system, of course. The disk is mounted just behind the spur gear, and it's activated whenever the throttle linkage is moved to the brake or reverse



Never has a car offered such a combination of scale-realism and performance. Kyosho's Ferrari 643 is the next level of R/C sophistication.

specifications

Manufacturer Kyosho
Type Formula 1
Scale 1/8
Price \$689.95

DIMENSIONS:
Overall length 21 inches
Width 11 inches
Wheelbase 14.25 inches
Front track 9.25 inches
Rear track 8.75 inches

WEIGHT:
Gross (with fuel) ... 4 pounds, 2.24 ounces

BODY:
Type Ferrari 643 F1
Material Polycarbonate

CHASSIS:
Type Two-piece plate
Material Fiberglass and aluminum

positions. The braking action can be adjusted to produce anything from a gradual halt to a tire-screaming stop.

The Ferrari F1 is a rear-drive-only car, and its transmission consists of a circular gearbox that houses a bevel-gear-type diff that isn't adjustable. Standard outdrives and dogbones round out the drive train.

Aerodynamics are important to F1 race cars; even minute changes in the angle of a wing can significantly alter a car's handling. Full-size F1 cars use bi-level nose wings to provide front downforce and a multi-level rear wing with as many as four or five planes to stabilize the rear end. Often, the front and rear wings have side dams that prevent the air from flowing off the sides of the wings.

For this model, Kyosho accurately reproduced the wings used on full-size Ferrari F1 cars. Both the front and rear wings are of molded plastic, and they're bolted securely to the car's chassis.

ASSEMBLY

To say that the Ferrari F1 is complicated is an understatement. Fortunately, the entire rear of the car comes built, and the engine and the drive line are installed. You only have to as-

If the incredible scale realism and excitement of Kyosho's new Ferrari 643 F1 turn you on, but you're hesitant to become involved with gas cars, Kyosho has something for you! The new 1/8-scale Kyosho Williams F1 does everything that its nitro-burning sibling does, but it uses electric power. The Williams is mechanically identical to the Ferrari, but it features a standard O.S. type motor and a 6-cell battery pack instead of the 643's O.S. CZ-R engine and brake system. So, now, you can experience the thrill of running a large, super-detailed gas model of Jean Alesi's Ferrari, and/or you can silently rip up the track with an electric version



of Nigel Mansell's virtually unbeatable Williams chassis. Oh and, by the way, the Williams body will fit the gas chassis and vice versa.

Mansell's
missile

semble the front end, paint and detail the body and install the radio gear.

To ensure that the car will operate properly, you must assemble the front end carefully. When you assemble the suspension arms, be sure to screw each ball end onto the threaded rod so that they just touch the arm's nylon portion. Don't overtighten them, because you might strip the threads or alter the arm's length, and this would mess up the car's handling. It's also important to assemble the numerous front-suspension tie rods in pairs, checking that the

rods in each pair are *exactly* the same length.

The shocks are easy to build. To ensure that the damping will be the same on the left and the right side, it's best to fill each pair of shocks with the same amount of oil (30WT silicone oil works well).

This is a gas-powered car, so you don't need an electronic speed controller. You do, however, need two servos—one for steering, the other for throttle—and a receiver battery pack (four AA batteries are sufficient). I use two Airtronics* 94102 servos (they came with my Caliper

3P) and a Trinity* 4-cell Ni-Cd pack to power the onboard radio system. Although it's easy to install the steering servo and hook up its linkage, it takes a little time to hook up the throttle and brake linkages properly. You have to make careful adjustments, and it's usually best to do so while the engine is running.

I almost forgot the most important gas-car assembly rule: always always use threadlocking compound on the metal-to-metal connections, e.g., screws and nuts, to prevent them from loosening owing to engine vibration.

ROAD TEST

To run the completed Ferrari, you only need fuel and a glow-plug igniter. It's best to use car-engine fuel, because it has special lubricants that aren't used in most model-airplane fuels. Fill up the tank and attach the igniter to the glow plug.

I only had to tug on the pull-starter four times before the O.S. Max roared to life. Then, I immediately adjusted the carburetor so that the engine would run rich, and this caused small puffs of blue smoke to come out of the exhaust.

To break in an engine, always use a rich setting for at least the first five or six tanks of

(Continued on page 94)

DRIVE TRAIN:

Primary Pinion/spur
Transmission Pinion/ring gear
Differential Bevel gear
Bearings/Bushings Bronze bushings

SUSPENSION:

Type (f/r) Independent
double-wishbone
Damping (f/r) .. Oil-filled, coil-over shocks

WHEELS:

Front: Type Molded "spoked"
Dimensions (DxW) 2x1.44 inches
Rear: Type Molded "spoked"
Dimensions (DxW) 2x2.375 inches

TIRES:

Front/Rear Foam rubber

RUNNING GEAR:

Engine O.S. CZ-R .12 engine

OPTIONS AS TESTED:

Trinity 4-cell Ni-Cd pack; Airtronics Caliber 3P radio and 94102 servos; Tekin TFM receiver.

COMMENTS:

With the Ferrari 643 F1, Kyosho has proven that it can not only create some of the most beautifully detailed and well-engineered R/C models in the world, but that it can also build a durable gas race car that performs extremely well. Yes, it's pretty expensive, and it may be too advanced for beginners, but this car will absolutely blow you away! The O.S. CZ-R engine sprang to life after the fourth pull of the starter, and it idled perfectly right out of the box. The good-looking Ferrari handled well on the track, so it has performance potential. Kyosho plans to release more F1 bodies soon, so you and your friends can race on different F1 teams.

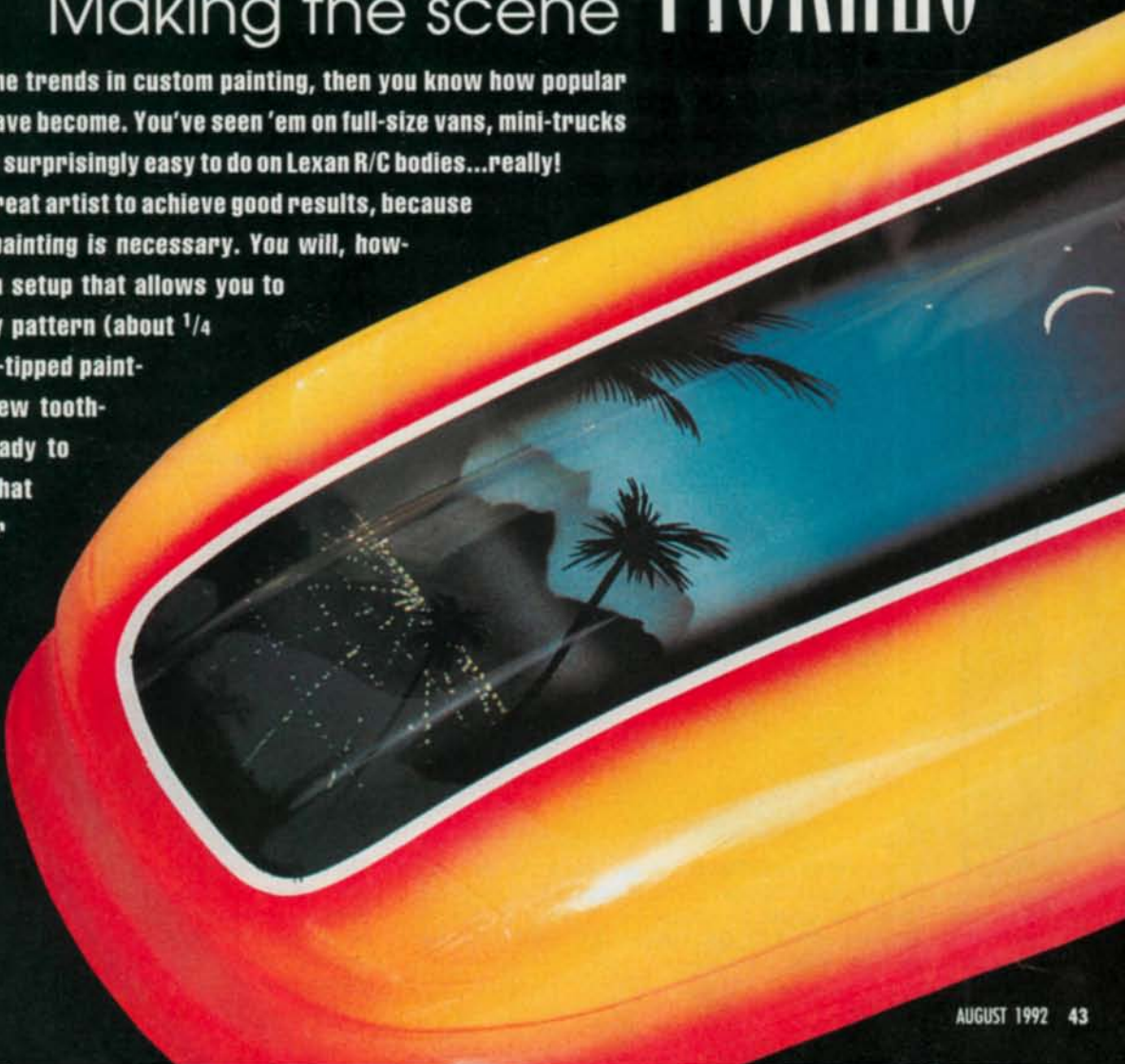


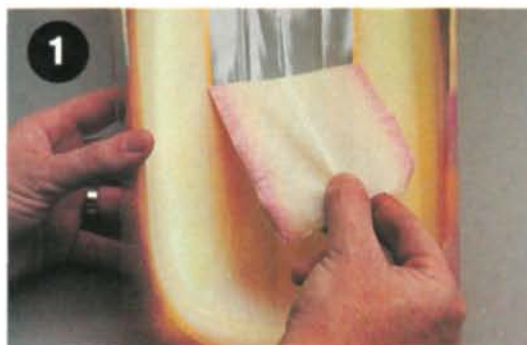
How TO PAINT MURALS

by MIKE OGLE

Making the scene

IF YOU keep up with the trends in custom painting, then you know how popular airbrushed murals have become. You've seen 'em on full-size vans, mini-trucks and show cars. And, it's surprisingly easy to do on Lexan R/C bodies....really! You don't have to be a great artist to achieve good results, because only a little freehand painting is necessary. You will, however, need an airbrush setup that allows you to create a narrow spray pattern (about $\frac{1}{4}$ inch or smaller), a fine-tipped paintbrush, a Q-Tip and a few toothpicks. So, if you're ready to try some paint tricks that will wow 'em at your next concours competition, let's get right to it!





Photos 1 and 2. First, mask off the area for the mural (usually a large, flat portion of the body, such as the roof or the hood); then paint the rest of the car's body as usual. (For some valuable tips, see Richard Muise's articles on painting Lexan bodies in the July '91 through October '91 issues of *Car Action*.) Unmask the area for the mural, and clean it off with denatured alcohol; otherwise, residue could show up as "dirty" areas in the paint.



Photos 3 and 4. Load your airbrush with black paint (thinned according to the manufacturer's instructions), and "fog" around the edges of the mural about $\frac{1}{4}$ to $\frac{1}{2}$ inch. This gives an illusion of depth and "frames" the scene. Make sure that the very edges of the mural are totally black before you go on to the next step.



HOW TO PAINT MURALS



Photos 5, 6 and 7. Take your fine-tipped brush, some black paint, and let's do some trees! Paint the tree trunks as stripes of solid black that run to the edges of the mural, so they'll blend with the black-fogged edge. The palm-tree tops (photo 6) are created with a technique called "dry-brushing." To do this, take your brush with just a little black paint on it, and fan five or six short strokes outward from the very top of the trunk. Don't reload your brush with paint; just feather out the palm fronds until you get that characteristic "puffball" look. You may want to refer to the photos and practice on a scrap piece of Lexan first, as this is the trickiest part of the whole operation.



Photo 8. If you want to do a tropical scene, use your brush and black paint to add the two black areas that jut into the scene from each side as shown. These can either be silhouettes of either islands or peninsulas. Keep the bottoms of these shapes flat, and add rocks or hills on the top if you want.



Photo 9. To indicate water, take the fine-tipped brush and some white paint, and make a bunch of thin, short, horizontal lines right down the middle of the scene between the islands. This simulates the sun or moon reflecting off the waves. Start at the horizon line with the smallest lines and gradually widen them as you come down to the bottom edge of the scene.



Photos 10 and 11. If you want to add a nighttime city scene to your mural, dip a toothpick in yellow paint, and create a grid pattern to simulate the city lights by placing small yellow dots all across the lines in the pattern. Again, as with the waves, make smaller dots closer together at the horizon line, and space them out as you near the bottom of the scene, which is the foreground. This gives the illusion of distance and adds perspective to the scene.

For an added touch of realism, you can add "haze" to your cityscape by using an airbrush to dust a thinned-out yellow band right across the horizon line. Make it about $\frac{1}{4}$ -inch wide (more for Los Angeles, of course) and not too heavy—just a thin band of color that you'll have difficulty seeing until the entire area is backed with black in a later step.



Photos 12 and 13. If you want mountains in your scene, tear a jagged edge on a piece of paper, and hold it in place as a mask just above your horizon line. Lightly fog the bottom edge using your airbrush and some black paint as shown. If you want more than one range of mountains, just repeat the process by tearing a new jagged edge and making the fogging lighter, and slightly above, the first mountains. This gives the illusion of mountains that are farther away and more obscured by haze. Artists call this "aerial perspective."



Photo 14. Now let's add a sun or a moon to the picture. The simplest way to do this is to blot in a dot of yellow (white for a moon) with a Q-Tip. It should make a nice round dot with no effort at all. You can place this dot as high in the sky as you want, as long as it's above the horizon line and toward the center of the scene. With a little more effort, you could add a "crescent" moon to your scene with some white paint on a fine-tipped brush. Sometimes I add a little airbrushed haze around the moon and a few stars in the night sky with a toothpick dipped in white paint.

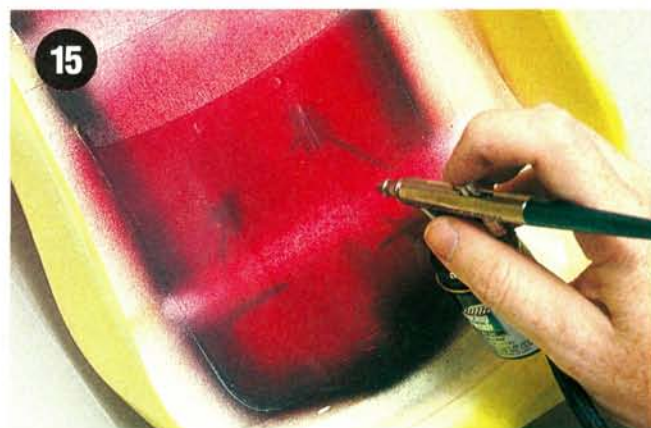


Photo 15. Almost done! Now you can finish the scene by airbrushing the entire area with the sky colors. For your classic Californian sunset, start by spraying the sky just above the horizon with a bright yellow or pinkish orange. Gradually change this to a deeper red as you go higher, and finish with a dark red at the top. For a night scene, try light blue just above the horizon, fade to medium blue, and finish with dark blue or black at the top.

That's it! Your first mural will probably turn out surprisingly well, and those that follow will be even better as you fine-tune your techniques. There are hundreds of variations on what I've presented here, e.g., try pine trees instead of palms for that Rocky Mountain look, or how about a silhouette of a sailboat against the waves, or seagulls in front of the sun?

Just remember that you're painting in reverse: paint the foreground first and the sky last.

With these basic steps, you should be able to come up with some interesting postcard scenes of your own. Use your imagination, and don't forget to clear off some shelf space for your new concours trophies!

by FRANK MASI

IN THE WORLD of top-level racing radio systems, it's very difficult for a new player to enter the arena. Models such as Airtronics' Caliber, Futaba's Magnum and PCM and KO Propo's EX-1 have set the standard for high-end 2- and 3-channel transmitters, and they present the stiffest competition.

JR Remote Control* isn't a newcomer to radio manufacturing; in fact, models from its popular Alpina line can be found in R/C cars and boats around the world. It wasn't until the release of its R-756 super transmitter, however, that JR Remote Control was able to produce a system that could compete, feature for feature, with the likes of those mentioned above.

REBELLIOUS RADIO WAVES

The R-756 is a 3-channel radio that's controlled by a microprocessor and, depending on the type of receiver used, it can be switched from PPM to PCM transmission modes. In addition, up to six different model settings can be stored in the radio's memory, and the R-756 boasts the most impressive variety of features currently available. These features are controlled by four trim dials (grouped around the steering wheel and on the grip), a six-button keypad (located on the battery housing) and a thumb-actuated button that can be set to operate one of several functions.

LCD DISPLAY

All trim and timing functions are displayed on the R-756's dot-matrix LCD, which features a four-step brightness adjustment, so that no matter what type of lighting you race in, chances are the LCD will be easy to read. The two-function menus are similar to the ones you're used to seeing on your home computer. To set functions and trim settings in either the system setup or the direct-entry modes, simply scroll through each by using the "up" or "down" buttons on the keypad.

SYSTEM SETUP

• **Grip-dial function select.** One of the first steps in setting up the R-756 is to assign the grip-dial functions for each model. Two adjustment dials, located on



**...but can
it make
toast?**

JR R-756

the unit's hand-grip portion, can control either the brake-trim function, the servo-travel (dual-rate) adjustment for the steering channel, or the steering trim.

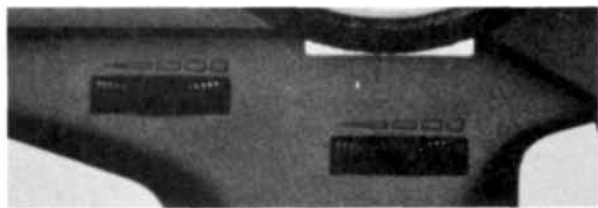
• **Thumb button.** Like the grip dials, the small, thumb-actuated button can be assigned either of two functions: a stop-watch "stop/start" button or a timer button (when used with the lap-timer function—more on this later), or a throttle-preset button, which, when pressed, allows the throttle servo or speed controller to return to a predetermined "neutral" position.

• **Model name.** One of the coolest features of the R-756 is its ability to memorize and store up to six sets of trim settings; so, theoretically, all you need to control six different R/C models is

the appropriate number of receivers. Also, the R-756 lets you spell out the name of each model on its display screen, so when you want to run your Schumacher Cougar, you just scroll through the model menu until you come upon "COUGAR" on the LCD. You won't have to memorize which settings control which models. (Note: the name must be limited to six letters, numbers or symbols.)

• **Fail-safe memory.** This feature can only be used when the transmitter is in the PCM transmission mode (this requires JR's PCM receiver, which wasn't included with the test radio). If, for some reason, the signal from the transmitter to the receiver is interrupted, the steering servo and the speed controller (or the throttle servo) automatically return to a

(Continued on page 48)



You can assign a different function to each grip dial. The small, silver thumb button activates the lap-timing function.

neutral setting, which will prevent the model from becoming a "runaway." This feature is especially useful for gas-powered models, which will keep going until they run out of fuel.

• Model clear and model copy

"Model clear" allows you to erase all settings for a particular model if you wish to enter another in its place. When clearing a model, all the settings are returned to the factory settings, and the model name is erased.

To duplicate one of the model's settings so that you can use it for another model, use the "model copy" function. This speeds up the process of entering new trim settings for another model.

DIRECT-ENTRY MODE

This is the second menu of the R-756's display. Direct mode is used to set the value for each model's trim setting by directly adjusting the keys and the trim dials. Once this has been programmed into the transmitter's memory, any alter-



Much of the R-756's programming is accomplished using this six-button, multi-function, soft-touch keypad. The "up" and "down" buttons let you scroll through the R-756's two menus.

ations to the trim settings (with the power off) will trigger the audible and visible alarms.

• **Stopwatch functions.** The lap timer is one of the R-756's most useful features. It's used to record and display lap times—just as an automatic lap counter at a racetrack can.

The lap timer can record up to 75 laps

for a total time of 99 minutes, 59.9 seconds. If you race 4-minute heats, you'll be able to keep track of your practice laps, your qualifying laps and your main-event laps.

To use the lap timer, simply go to that function on the LCD display,

press the "+" and "-" buttons at the same time to achieve "ready" status, and the timer will start when the throttle trigger is depressed. When your car crosses a finish line, hit the thumb button, and the



The multi-function LCD helps you to keep track of vital information. It has a 75-lap counter and a timer, and it provides memory for up to six models.

R-756 will record the time interval as one lap. If you know exactly how long your heats and mains will be, you can also program the lap timer to automatically stop at the desired time; say, 4 minutes. The timer will officially stop only when the thumb button is once again depressed, allowing you to complete your final lap. So that you won't have to take your eyes off your car, the R-756 will sound an alarm every minute during timing to let you know how much time has elapsed.

The R-756 not only counts laps, but it also allows you to scroll through all recorded laps, which helps to gauge the effectiveness of your chassis tuning. For instance, if you turned consistent 21-second laps in your first qualifying round, you'll know, by checking lap times, whether the different tires you tried in

heat two made you go any faster. If you can turn consistent 20-second laps with the different tires, then you have concrete proof that you've made the correct choice.

In addition to lap timing, the R-756 provides you with a simple up-timer that begins to count with a touch of the thumb button. It can be paused or stopped by pressing the button a second time.

• **Trim and dial memory.** Have you ever placed your car on the starting grid, only to find that somehow, while the radio was in the impound, its trim adjustments had been altered? This has happened to me on occasion, and it's very frustrating.

To solve this problem, the R-756 sounds an alarm when it's activated if any of the trim dials have been altered since the unit was last used. In addition to the alarm, the R-756 provides a display on the LCD screen that indicates which trim dials were moved—and how far they were moved, so you can easily return them to the proper positions.

• **Model select.** As stated before, the R-756 can store trim settings for up to six different models at a time. A unique part of this function is that you can denote each model by entering a six-digit code of either letters or numbers (punctuation and several symbols are also available).

If you have to change the position of the trim dials, the correct positions for a particular model will be shown on the LCD display when you switch from one model to another.

• **Steering adjustments.** The trim-rate adjustment dictates the amount of influence the steering travel-rate dial will have upon the total amount of servo travel. It can be varied between 3 and 15 degrees, depending on what you prefer. You'd choose a lesser amount of travel change if you only wanted to make minute changes and a greater amount if drastic changes in steering travel were required.

The travel-adjustment function is controlled by one of the transmitter's grip dials, and it can increase or limit the movement (left and right) of your steering servo. This is used most frequently in on-road cars to tailor steering characteristics while you actually drive the car.

The balance adjustment lets you independently set your steering servo's travel

(Continued on page 192)

C O X

Turbo Scorpion

Venomous sting

by STAN VANDRUFF

AFTER giving up flying control-line planes (it's been a while) and running gas boats on "too-small" ponds,

I often thought about trying R/C electric cars. Late in 1986, I casually mentioned this to my wife, and I woke up on Christmas morning to find a Cox® Turbo Scorpion under the tree.

I found the Turbo Scorpion exciting because it has a realistic dune-buggy body and a Volkswagen-inspired suspension. It was also the first model car that I had ever seen with oil-filled, coil-over shocks, an aluminum chassis and a functional differential!



**Time
Warp**

COX'S FIRST

Introduced in 1982, Cox's first electric R/C car—the Scorpion—had a suspension that was far superior to those used on most popular cars of the day. The car carried Gil Losi Jr. to the '83 SCORE World Championship and, spurred on by such successes, Cox added the Turbo Scorpion to its catalogue. The word “Turbo” meant that this car was given a “beefier” suspension and a much-needed differential.

Despite the dominance of Associated's RC10, the Turbo



Here's the aluminum rear trailing arm. Although aluminum is stronger than nylon, it isn't as flexible. A crash that would cause a nylon part to bend might cause a rigid aluminum part to break.

Scorpion cleaned up at the '85 ROAR Nats in Texas. According to Gil, its suspension was perfect for choppy surfaces (A&L still sells RC10 suspension conversions that use Scorpion rear arms). The car's Achilles' heel, however, was its fragility. As more racetracks incorporated big bumps and jumps, the Turbo Scorpion became impractical. In 1989, Cox

took it off the market, and Tower Hobbies* bought the remaining stock. A while ago, I noticed that Tower was selling the cars for only \$60 each, and I decided to have another go at one. (Mine had long since been retired.)

WHAT'S IN THE BOX

The well-labeled parts come neatly packaged in a huge box. The shocks are assembled and the 540 motor is installed in the transmission. Most of the fasteners are nuts and bolts instead of the self-tapping screws you usually see today, and Cox thoughtfully included thread-locking compound.

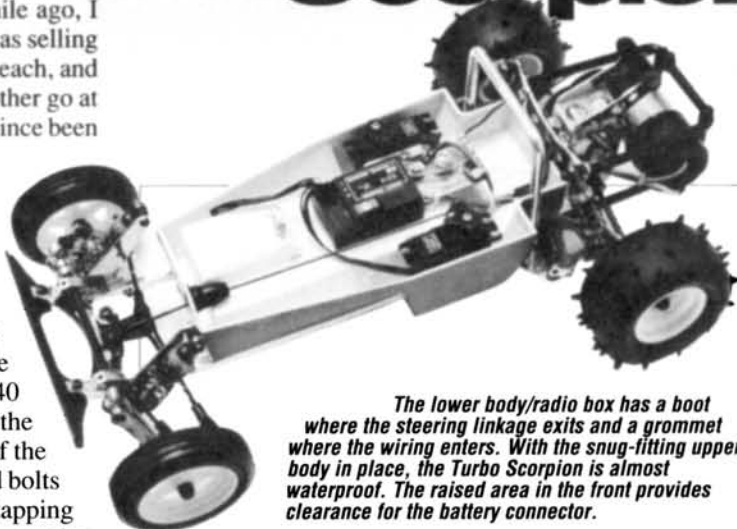
Kit makers could learn a few things from the Turbo Scorpion's excellent 23-page instruction manual. It features a drawing of each assembly and every part. At each step, I made sure that I had the right screw by holding it up to the appropriate illustration. The last three pages are devoted to setting up and running the finished car.

PARTS IS PARTS, BUT THESE ARE SHINY

I could have put the car together in an evening, but I knew that I'd look at it more often than I'd actually drive it, so I spent three nights polishing its 30-odd aluminum parts.

The lower part of the body is also

Turbo Scorpion



The lower body/radio box has a boot where the steering linkage exits and a grommet where the wiring enters. With the snug-fitting upper body in place, the Turbo Scorpion is almost waterproof. The raised area in the front provides clearance for the battery connector.

the radio box, so painting it was one of the first steps. It's made of heavy white polystyrene, so I painted it with plastic-model paint, which is glossier than that made for clear bodies. The polycarbonate upper body was machine-cut accurately, but I spent a few seconds cutting out the wing. It was a pleasant challenge to paint the driver's body, his helmet and the seat belts.

The well-made mechanical speed controller has three forward and one reverse speeds as well as a brake. (By installing an optional resistor, you can add a fourth forward speed.) I mounted the heat-dissipating resistors on the heat sink, which is bolted to the top of the

transmission and doubles as a wing mount.

I still have the Cox stick radio that my wife gave me with my first car. Although I never really got the hang of using sticks, I decided to try again with the Turbo Scorpion.

The Scorpion's radio box doesn't have any mounting holes, so the servos must be secured with double-sided tape. This worked well for the steering servo, but the linkage for the speed controller was very short, so it bound slightly and caused the controller's servo to loosen. To solve this, I used heavy-duty, double-sided cloth tape.

You install the battery pack in an underside compartment. To remove it, just release the latch; the door comes off and the pack drops out. You never have to remove the top of the body and let dust into the radio box.

If you've marshalled many races, you know that no two drivers put their on/off switch in the same place. On some cars, the switch is easy to shut off during crashes; on others, you can't find it.

(Continued on page 56)



Turbo Scorpion

Manufacturer Cox
Type Off-road
Scale 1/10
Price N/A

DIMENSIONS:
Overall length 15.75 inches
Width 8.86 inches
Wheelbase 10.24 inches
Front track 7.16 inches
Rear track 7.32 inches

WEIGHT:
Gross (with battery) 58.2 ounces



The chassis rail, the shock tower and the trailing arms are made of aluminum. This realistic setup allows you to adjust caster, camber and toe-in, but it's quite complex—lots of patience required.

BODY:
Type Open-cockpit, off-road buggy
Material Polycarbonate and polystyrene

CHASSIS:
Type Rail
Material Aluminum

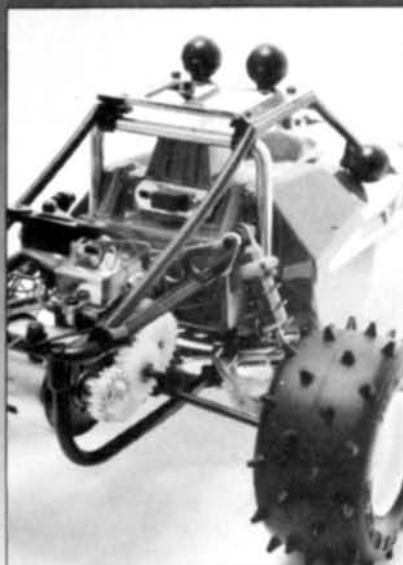
DRIVE TRAIN:
Primary Spur gear
Differential Bevel gear
Bearings/Bushings Bronze bushings

SUSPENSION:
Front: Type Trailing arm with upper control link
Damping Oil-filled, coil-over shocks
Rear: Type Trailing arm
Damping Oil-filled coil-over shocks

WHEELS:
Front: type Two-piece nylon
Dimensions (DxW) 2.0x0.5 inches
Rear: type Three-piece nylon
Dimensions (DxW) 1.6x1.25 inches

TIRES:
Front Rib
Rear Spike

ELECTRICS:
Motor RS540S
Battery Not included
Speed controller three-step mechanical with reverse and brake



To change the gear ratios, you must simultaneously replace the pinion gear and the idler gear with which it meshes. The motor position is fixed. Notice the well-protected on/off switch.

OPTIONS AS TESTED:
 Boca ball-bearing kit; Cox Sanwa two-stick AM radio.

COMMENTS:
 The Turbo Scorpion has a realistic dune-buggy body, and a lot of aluminum that you can polish! It handles very well on moderately rough surfaces, but it doesn't take kindly to punishment. Still, because its radio gear is housed in a sealed box, the Turbo Scorpion can withstand adverse running conditions that would sideline most of today's buggies. If you chance upon one of these cars in your hobby shop, consider buying it!

(Continued from page 55)

(This usually happens at the worst possible time, e.g., when the car is cutting donuts on your leg!) The Scorpion has a slide switch (with a protective dust boot) that's mounted on the exterior of the body, behind the driver. It can't be accidentally turned off, yet you can reach it easily when necessary.

I found a Boca* bearing set in my toolbox—a leftover from the days of my first car. I couldn't stand to see it go to waste, so I installed it in the Scorpion, and I headed for the track.

TAKE ME FOR A SPIN

It's difficult to set up the Turbo Scorpion's front end properly, let alone maintain the settings. Although it has caster, camber and toe-in adjustments, they're all interrelated, i.e., when you adjust camber, you throw off caster and toe-in.

The suggested settings didn't work very well because they caused too much bump-steer. It took me an hour to figure out the relationships between the adjustments and to set up the steering to my liking.

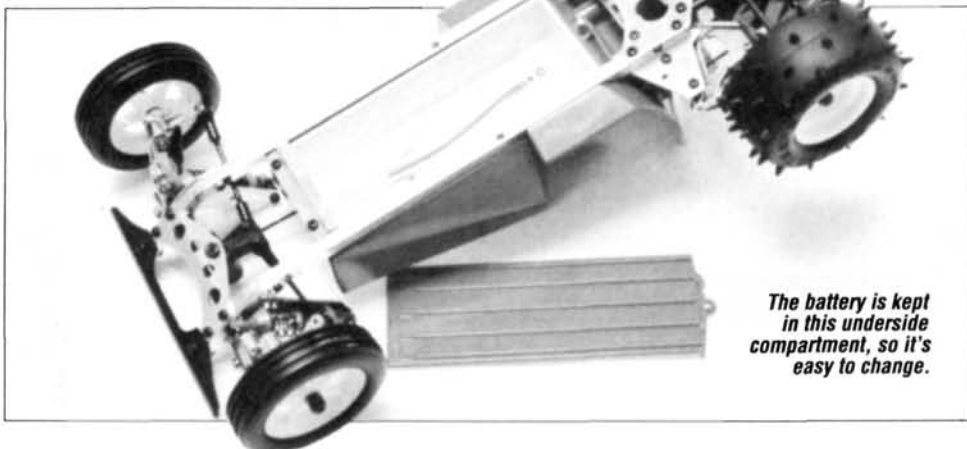
The front ribbed tires are quite narrow, and they run on unusual two-piece rims. Without glue, they'd easily slide off. The tall-spiked rear tires don't provide much traction

(maybe on shag carpet). The three-piece wheels, which hold the tires in place securely, are held to the tapered rear axles with friction washers rather than the cross pins or hex drives used on most cars.

You can only use

a few gear ratios in the transmission. The motor position is fixed, so you have to replace the pinion and idler gears at the same time to alter the gear ratios. With two pairs of gears and the supplied 540 motor, the stock Scorpion has two speeds—slow and not-very-fast. This doesn't really bother me, though. I want to

(Continued on page 100)



The battery is kept in this underside compartment, so it's easy to change.

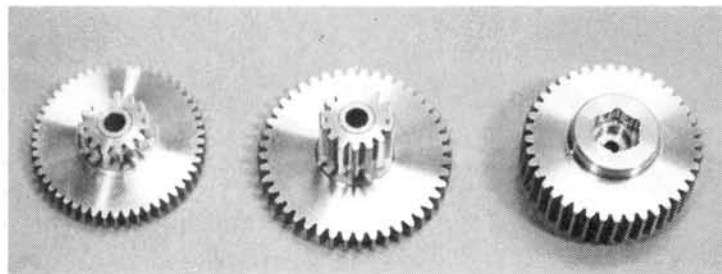
TRUCK STOP

by DAVE SPROUL

One Call Does it All

IN THE FEBRUARY '92 "Truck Stop," I showed you how to build a bulletproof Clod gearbox using parts offered by several after-market suppliers. In this issue, I'll show you how to do the same thing with a phone call to just one supplier! JPS* now offers a complete replacement gearbox assembly that consists of a billet-aluminum gearbox, axle tubes, steering knuckles and ladder bars as well as precision-machined-steel gears and rear axle shafts. Although you have to order the components separately, they're all compatible with the stock plastic pieces, e.g., the aluminum gearbox will work with plastic axle tubes and the aluminum axle tubes will work with the plastic gearbox, etc.

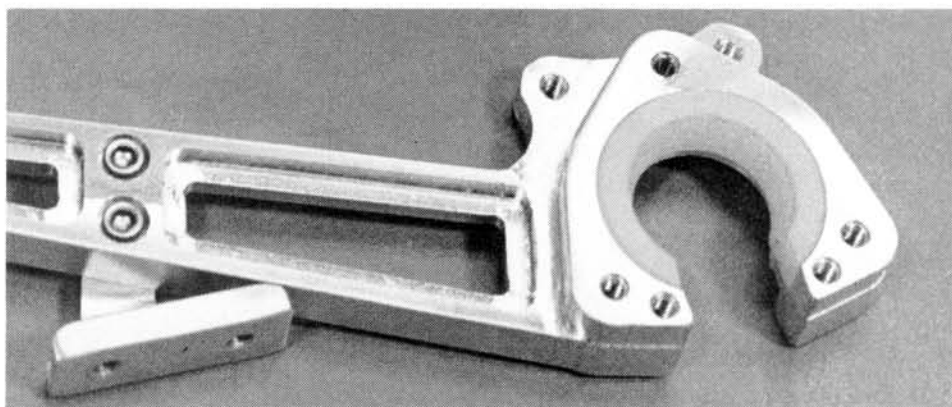
The JPS gearbox is a machined work of art. The finish is attractive as is, but you can really enhance its appearance by polishing it. The aluminum axle tubes are just as nice as the gearbox, and they're available in steering and "non-steering"



JPS now offers high-quality, machined-steel gears for its Clod aluminum gearbox. The final drive gear uses stock hex-drive adapters to drive the splined axles.

configurations. You can use two steering axles for 4-wheel steering, but I recommend that you use straight axles in the rear. In my experience, trucks with 2-wheel steering are much more stable and easier to drive. For pulling applications, 2-wheel steering is mandatory.

The steel gears fit better than any I've ever seen. After you've installed them



The beautiful machined-aluminum ladder bars replace the original plastic units perfectly. They have nylon inserts to reduce wear at the axles.

(and high-quality ball bearings, too!), you can easily spin them by hand; there's no resistance at all—very nice! The final drive gear doesn't use a diff, but it does accept the stock brass hex-drive adapters that drive the splined axles. JPS also offers a two-piece, heavy-duty-steel, rear-only axle that works very well with the straight axle tubes.

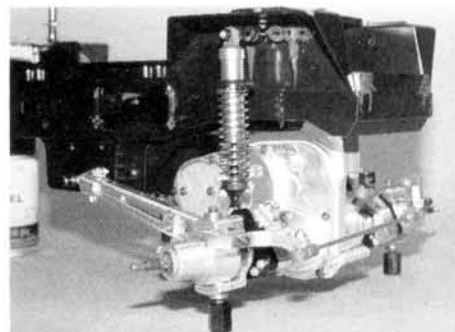
The ladder bars are as nice as the other aluminum parts, and you can use them to replace the black plastic pieces in the Clod kit. JPS designed the bars with a machined-nylon insert in the axle end. The insert surrounds the "ball" on the axle tube, and this reduces the wear caused by metal-to-metal contact when you use aluminum axle tubes.

Steel gears aren't necessary if you plan to race your Clod or run it just for fun. The stock plastic gears work very nicely in the JPS gearbox, and they're sufficient for general use. If, however, you plan to enter your Clod in a modified pulling competition, the steel gear set is a must.

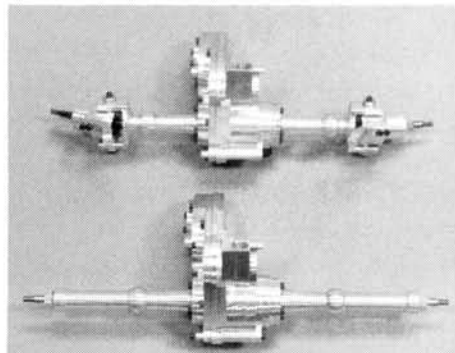
The complete JPS setup is very strong, and I seriously doubt that any of the com-

ponents will break. The steel axles are the only possible exceptions, and even the chance that they'll break is small.

All these high-tech-aluminum and precision-machined-steel parts don't



The complete front assembly includes the JPS gearbox, gears, axle tubes, steering knuckles and ladder bars.



Here are the complete front and rear assemblies. The rear unit has straight axle tubes and axles for a strong, "non-steering" setup.

KILLER CLOD PARTS!

JPS HAS IT! Super-strong machined billet aluminum gear-boxes are a direct replacement for the stock plastic components, and feature an adjustable motor mount for a wider range of gear ratios. Along with our new Steel Gear Set, it's the ultimate Clod accessory for full-pull strength!

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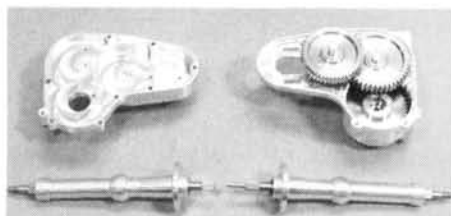
• Single and
Dually Clod
Rims
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• Aluminum
Ladder Bars
#7070



MADE IN U.S.A.

come without stiff price tags. These days, however, with battery packs that cost as much as \$80 and some motors that cost twice that amount, the JPS parts seem reasonably priced. This is especially true when you consider the time that it takes



Here's the JPS gearbox with the gears installed. The straight axle tubes fit either the stock or the aluminum gearbox and accept stock or after-market axles.

to manufacture them and that you'll probably never have to replace them.

Next time, I'll discuss the increasing popularity of gas trucks and what's available. See you again at the "Truck Stop"!



The front steering axle tubes use very nice machined steering knuckles. Here, the stock Clod axle shafts were used.

*Here's the address of the company featured in this article:

JPS Custom Wheels, P.O. Box 3014, Fullerton, CA 92631.



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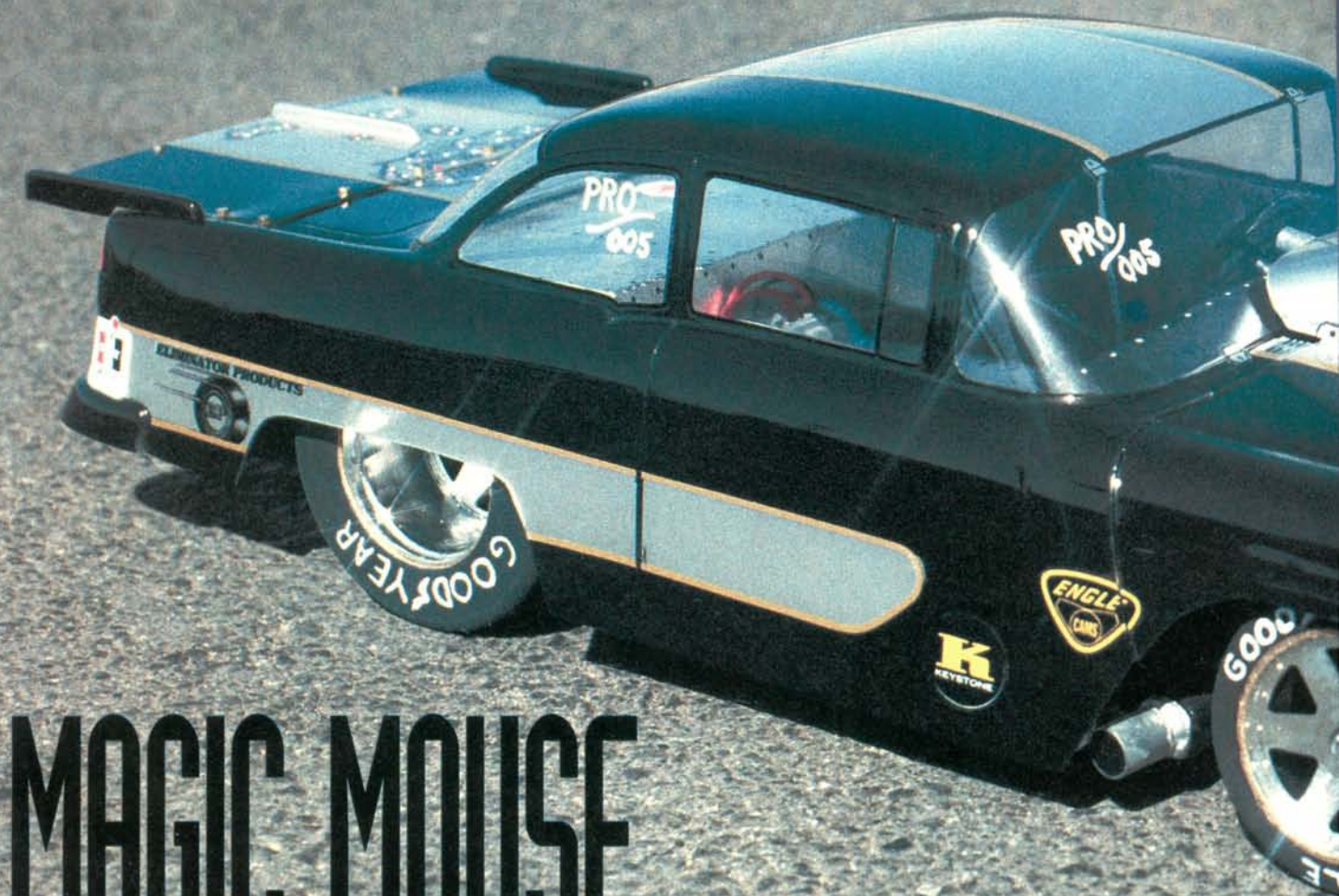
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MAGIC MOUSE

by JEFF BRONSTEIN

MOST HOME-BUILT projects begin innocently enough, but somehow they snowball into obsessions. So began Perry Bassham's endeavor. He had planned to build a '55 Chevy Pro street concours car. Once he started, however, he couldn't turn back, and he ended up with a unique, detailed, functional car—a fine, scale masterpiece.

Perry credits his success to his supportive family, without whom he could never have completed the killer "Magic Mouse." Such a project takes a lot of time and effort as well as a wife who will put up with many late-night building sessions.

Perry custom-made a G-10

fiberglass chassis, to which he mounted a standard Associated* 10L front-end setup. To make room for the engine-compartment detail, he had to position the JR* steering servo under the passenger side of the interior. A small threaded rod runs unobtrusively through the firewall to an Associated bellcrank steering system that's mounted under the engine.

To accommodate the fat slicks under the fenders, Perry narrowed the C&M/ Team Cobra* rear pod by 1⁵/₈ inches. He also narrowed the rear axle so that the 38-degree Fantom* stock motor would fit snugly between the wheels. He mounted the

DuraTrax* DTX-4 ESC and the JR receiver to a small fiberglass plate (bolted to the top of the pod) that extends into the trunk. Even after all the radio gear has been mounted, there's still enough room in the trunk for an Associated battery box and a 6-cell pack.

With all the equipment installed in the rear, the car did "wheel stands" during the acceleration tests. To solve this, Perry installed a fully detailed Parma* Hemi engine up front. It has lines for oil, fuel, brake fluid and nitrous as well as engine injectors and a master cylinder. He also molded each of the fender-well exit headers into the Hemi exhaust. To display

this extremely trick engine, he made a hood by carefully detaching the body's front end. Then, he attached custom-made, aluminum-stock hinges to the hood and the chassis so that he can tilt the hood forward. Perry provided the engine with clearance and preserved the front end's smooth, fluid lines using a Parma Pro street hood scoop.

To keep the front end under control, he designed a set of functional, brass-stock wheelie bars and attached them to the car's rear end. The model airplane wheels on the bars look trick, and they work like a charm. To finish the rear end, Perry attached a Pro stock wing to the body using brass 00-90

rabid transfer



HOME-BUILT PROJECT

the body's lower edges.

Perry painted the outside of the car in a classic black-metallic scheme, and he applied silver accents and gold pin-stripes. He drew the custom Magic Mouse logo on the hood himself.

Perry had to narrow the Pro-Line* chrome spoke wheels by $\frac{3}{8}$ inch so that they would clear the body. He cut grooves into the Southwest* blue-dot rubber front tires so that they appear to have treads, and he "radiused" the edges of the huge, $\frac{1}{8}$ -scale, rear Gomme* tires just enough to give the car a slick, drag-racing look.

This clean, good-looking car is completely functional! On its trunk, Perry wrote a sincere acknowledgement to his family for their support and encouragement. Most of his gratitude goes to his wife who put up with his obsession. Mrs. Bassham, can Perry start sleeping in the house now?

*Here are the addresses of the companies mentioned in this article:

Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

JR Propo; distributed by Hobby Dynamics Distributors, P.O. Box 3726, Champaign, IL 61826.

C&M Mfg./Team Cobra, P.O. Box 701-353, West Valley City, UT 84170.

Fantom Racing, 209 N. Haver St., Hartford, MI 49057.

DuraTrax; distributed by Great

PARTS LIST

Associated Electrics

- 10L front-end setup
- bellcrank steering system
- battery box
- 6-cell battery pack

C&M/Team Cobra

- rear pod

DuraTrax

- DTX-4 ESC

Fantom

- 38-degree stock motor

JR Propo

- steering servo
- receiver

Paris Racing

- Gomme $\frac{1}{8}$ -scale rear tires

Parma

- Hemi engine
- Pro street hood scoop

Pro-Line

- chrome spoke wheels

Southwest Tire

- blue-dot rubber front tires

Miscellaneous

- G-10 fiberglass for scratch-built chassis
- threaded rod
- fiberglass plate
- aluminum stock
- brass stock
- model airplane wheels
- Pro stock wing
- brass 00-90 bolts
- parachute assembly
- cardboard
- straight pins
- antenna tubing
- nylon model airplane hinge
- Velcro®

bolts, and he installed a parachute assembly, too. Perry made the intricate interior details, i.e., the bucket seat, the gauge assemble, the foot pedals and the interior panels, of cardboard. He installed a foot-throttle pedal (borrowed from one of his son's toy trucks), and he used straight pins to make the gear-shift levers that are just to the right of the bucket seat. Before he mounted the interior assembly to the chassis and the body, he painted it with aluminum paint.

To make a roll cage, Perry heated antenna tubing and bent it into the appropriate shape. For the finishing touch, he added a complete nitrous system that includes valves,

lines and its own power system (also borrowed from his son). He carefully cut out the driver-side door and then reattached it to the body with a small, nylon, model airplane hinge. He used cardboard to make the door panel and the latch handle/safety lock. Then he attached the entire body to the chassis using Velcro® strips that run along

PHOTOS BY JEFF BRONSTEIN



Planes Model Distributors, P.O. Box 9021, Champaign, IL 61826.
Parma International Inc., 13927 Progress Pky., N. Royalton, OH 44133.

Pro-Line USA, P.O. Box 456, Beaumont, CA 92223.

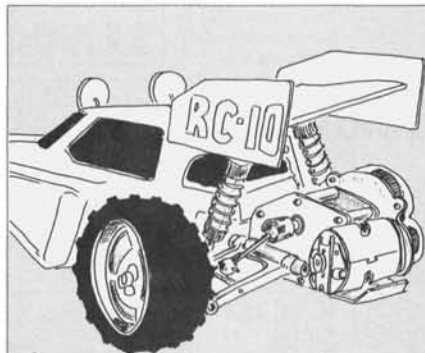
Southwest Tire, 13 Jardin Rd., Los Lunas, NM 87031.

Gomme; distributed by Paris Racing, 4254 Independence St., Chino, CA 91710. ■

Parma's Hemi engine makes it hard to distinguish this model from a full-size car. Parma's hood scoop enables the hood to clear the engine's blower.

TROUBLESHOOTING

by FRANK MASI



IN THE SWING (SHAFT) OF THINGS

I own an Associated RC10 Championship Edition. Whenever I drive it, the universal drive shafts fall out of the outdrives in the stock tranny. My friend who works at an R/C car shop told me to take off the washers that go behind the pin on the universals and put them on the inside of the hub carrier. I've done it, but the universals still come out. Can you help me?

Joe Kwong, Sacramento, CA

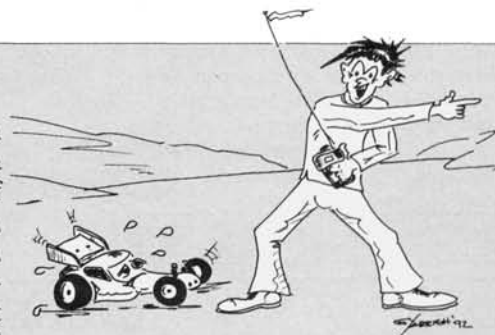
First, check that the car's rear camber setting is correct. If your car has too much positive rear camber, i.e., tops of the tires lean outward, then adjust the turnbuckle camber linkage until it has negative camber, i.e., tops of the tires lean inward. If you give your car about 2 degrees of negative camber, its handling will improve and the universals will extend further into the outdrives. If this doesn't solve the problem, use spacers to limit the amount of rear suspension travel. Dissassemble the rear shocks and put the spacers on the shaft before you reassemble them (be sure to use the same number of spacers on the both the left and the right shocks). If you limit the travel too much, handling will suffer, so limit it just enough to keep the universals in place.

GIVE IT A REST!

Your magazine is the best around. I'm new at R/C, and I recently bought a Futaba FX10. When it's almost out of power, I can't control it. I hit the gas, and it just keeps going. It won't stop, even when the car and the speed controller are off. I use a Dynamite Sport K100 SCR battery and a 6/7-cell DC charger. Yes, I trickle-charge the battery overnight before I use it. Please help me.

David Byrnes, Wolcott, CT

David, to operate, your on-board radio system, i.e., the servos, the receiver and the speed controller, requires a certain amount of voltage. If the voltage from the main battery pack drops below this level, then the radio system



can no longer function properly, and the car will become a "runaway," as yours is. The solution is simple: when your car slows down, pick it up and turn it (and your transmitter) off! If you want to discharge your pack fully before you recharge it (and I recommend that you do), hold the car off the ground and run it until the motor stops. Let the pack cool, and then charge it.

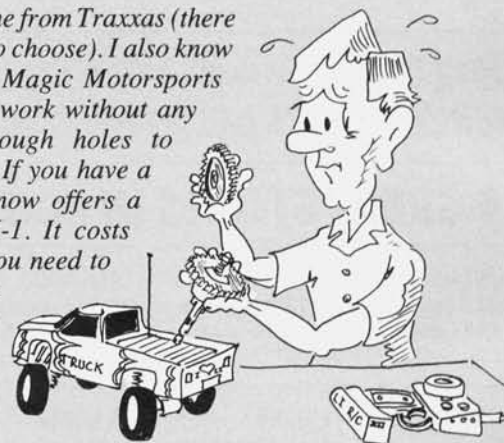
SLIPPER SAVVY

I've owned a Traxxas Blue Eagle for about a year, but I've just started racing on an off-road course. I installed a Trinity 13-turn, triple-wind modified motor, a Robinson Racing 90-tooth spur gear and a 14-tooth pinion.

I use the holes in the spur gear as mounting holes for the friction pins. The problem is, the larger spur gear doesn't have as many holes as the stock version. Because I can only use half as many friction pins, the clutch doesn't work as well, and I have to replace the pins about every third run, which is becoming expensive. Does anyone make a conversion that will let me use a setup with a friction ring, or does anyone manufacture a spur gears with more holes?

W. Deen Richardson, Oakland City, IN

You can replace the spur gear with one from Traxxas (there are many different sizes from which to choose). I also know of racers who've had success with Magic Motorsports Stealth spur gears. They appear to work without any modifications, and they have enough holes to accommodate the Rulon slipper pegs. If you have a little more money to spend, A&L now offers a Power Clutch slipper for the TRX-1. It costs \$40.95, and it includes everything you need to install it. The nice thing about the Power Clutch is that, unlike the stock slipper, it allows you to change the spur gear without affecting the slipper settings.



COMING NEXT MONTH!

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OFF ROAD CHAMPS

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Time Warp: Tamiya Golf
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R/C RACER

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ROAR 1/12-Scale Nats
Speed Shop

TRACK REPORTS

Team Losi LX-T
Kyosho Raider Truck
BMT 892

COLUMNS

Nitro News
Scoping Out
Troubleshooting

TROUBLESHOOTING

NOSE-DIVING '10

My RC10 has a problem. I race at an outdoor track that has a lot of jumps. When my car takes a jump, it nose-dives and cartwheels. I have a Tekin TSC 411P and a Trinity Slot Machine motor.

Eric Maher, Freeland, MI

Before you do anything to your car, ask yourself these questions: have other drivers at my track experienced the same problem? If so, have I asked any of them what they've done to overcome the problem? If the jumps on your track cause cars to nose-dive, you can either petition the track officials to alter the jumps, or you can change your driving technique. If your car doesn't handle certain jumps well, take them slower.

There's no such thing as a car that works perfectly on every part of a track—setting up your car is a compromise; finding the best overall setup is all that even the most experienced racers can expect. If you've determined that the problem lies in your car's setup, then talk to successful racers and try their setups. A good beginning for the RC10 is 30WT shock oil (front and rear), Associated's green springs (front and rear), 2 or 3 degrees of toe-in on the front and 2 degrees of negative camber up front and in the rear.

The ride height should be set so that, if you drop the fully equipped car from a height of 8 to 12 inches, the car's rear A-arms are parallel to the ground and its front A-arms are slightly above parallel.



ABLE TO LEAP TALL BUILDINGS

I'm an R/C beginner, so I bought a Tamiya Grasshopper II Super G. When I felt ready to modify my car, I installed a Twister Scorpion 44-degree stock motor in it. Once in a while, when I drive the car off a curb, a gear comes loose, and I have to take my gearbox apart. Can you tell me how to repair it without replacing the whole gearbox?

K.C. Cordara, Pomona, CA

K.C., when a mechanical device (say...an R/C car) is subjected to a sudden shock (say...when it's driven off a curb), something has to give. No matter how well-built the car is, the shock will be transmitted from the tires, through the gearbox, to the motor. Usually, one of the transmission components gives first. Your problem is probably a result of the differential's gears separating under loads. The Super G's diff bevel gears drive the outdrive shafts, which drive the rear wheels. If too much strain is put on the gearbox, the outdrive shafts may pull away from the diff gears; this will

cause a clicking sound and, eventually, the gears will be stripped. To prevent this, place one or two small shims (depending on the amount of play your tranny has) between the outdrive shafts and the inner bushings upon which they ride. This forces the shafts and the gears inward toward the diff gears, and makes it impossible for them to separate and become stripped.



If you have a technical problem that your hobby shop or racing friends can't resolve, give us a shout at Radio Control Car Action, and we'll see if we can chase down an answer for you. Questions should be of a technical nature and should be addressed to Troubleshooting, c/o Radio Control Car Action, 251 Danbury Rd., Wilton, CT 06897.



LOSI SHOCK LOWDOWN

On my JRX-Pro SE, the shocks' hard, black coating has faded to a dull gray. Also, the new shock cartridges make the shocks hard to set up, and they leak more than the old type. Is there a special way to set up the new shocks? Finally, why has Losi gone back to the short-shock setup in the front?

Richard Ducan, Skokie, IL

Unlike the old Losi shock cartridges, the new ones don't have volume compensators. (Compensators provide space for the oil that's displaced when a shock is compressed and the shock shaft enters the body.) One reason Losi eliminated this feature was that many racers complained that it leaked.

To build the new shocks, fill the body with oil up to the bottom of the threaded area. Insert the shock cartridge (with the piston and the shaft installed, so that the piston touches the cartridge), and thread it into the body until its O-ring seal touches the body; then, unthread the cartridge by about $\frac{3}{4}$ of a turn. If you've used enough oil, some will leak out between the shock body and the cartridge as soon as you start to thread the cartridge. If it doesn't, remove the cartridge and add more oil. Now, slowly compress the shock all the way to "bleed" the excess oil (wrap the shock body in a rag to absorb the oil). Slowly draw the shaft out of the body to remove any trapped air. You should see tiny air bubbles at the body's opening. Compress the shock again, but this time only about $\frac{1}{2}$ inch. Withdraw the shaft and tighten the cartridge completely using pliers. Don't overdo it; $\frac{3}{4}$ of a turn should be enough. The shock should be nearly perfect, with about $\frac{1}{2}$ inch of rebound.

It's hard to pinpoint why Losi has switched back to shorter front shocks. Designers generally try to attain the best shock performance using the smallest, i.e., lightest, possible shocks.

Regarding the discolored shock bodies, contact Team Losi at 13848 Magnolia Ave., Chino, CA 91710.

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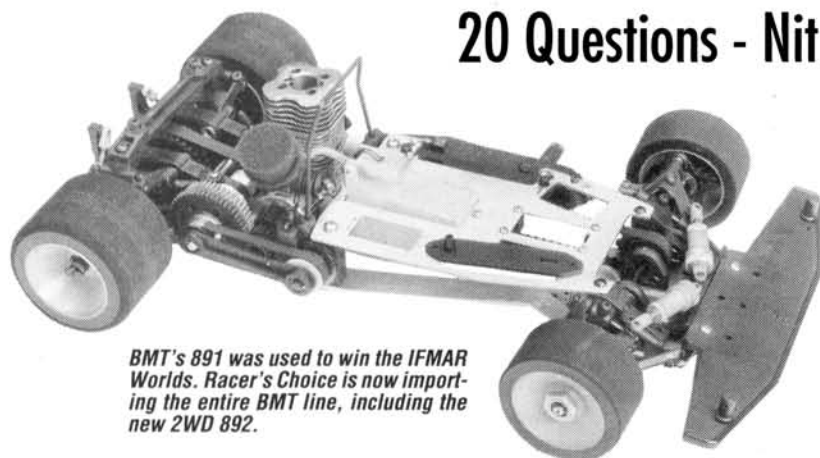
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NITRO NEWS

by JEFF BRONSTEIN

20 Questions - Nitro Style



BMT's 891 was used to win the IFMAR Worlds. Racer's Choice is now importing the entire BMT line, including the new 2WD 892.

THE HEART of nitro racing is beating, and its lively rhythm is about to rock the socks off a whole new generation of speed demons! Because of its rapid growth, the nitro industry has been hit by so many hot developments that it's enough to make your head spin. Many of you have expressed just such a sensation in the question-filled letters that we've received. Well, hold on to your head spacing, boys and girls. These 20 Q&A about such things as nitro R&D should set you straight, PDQ!

Q Now that Paris Racing* has established a relationship with Italian car manufacturer Picco*, what will become of the Associated* RC-500 car?

A Associated will continue to distribute the RC-250, RC-300 and RC-500 cars, but Team Paris/Associated has put most of its eggs in one basket with the new Picco Genesis F1. (Paris is already developing after-market parts for it.) Although Paris will still offer Rex engines, the new Paris-spec Picco P-5 also looks very strong.

Q Will Arturo Carbonell, the reigning ROAR Nats Champ, drive the Picco car in '92?

A Nope! Art now drives for the world championship-winning BMT team, and he's working with Racer's Choice*, which distributes the BMT 891 in the U.S. At this year's Nats, Art plans to shoot for back-to-back wins using two different cars.

Q Has Serpent* re-invented the clutch?

A It's too soon to tell whether Serpent has "re-invented the clutch," but I will say that its new "pressure-plate" clutch is unlike anything I've ever seen. Although spring clutches have undergone

many improvements, they're often unreliable and difficult to tune. The efficient Serpent design is reliable *and* you can adjust it externally.

Q What drove the wedge between Kyosho* and BMT?

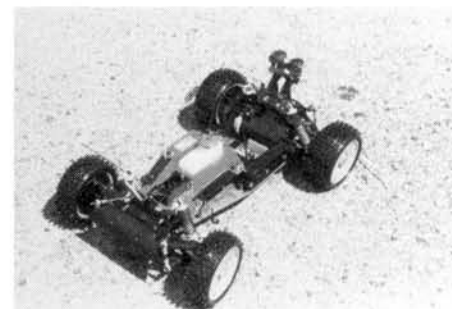
A Who cares?! Now we have *two* new $1/8$ -scale off-road cars that can kick up the dust! BMT's 911 car may have opened the gap; Kyosho simply responded with the Inferno—a full-blown racer of its own. Either one should give Mugen* and OFNA* a run for the money.

Q The BMT 891 and the Picco Genesis F1 seem to have similar designs, but which car actually came first?

A Although the U.S. distributors of both cars (Racer's Choice and Paris Racing, respectively) respect each other, the Italian manufacturers are fierce rivals. Although each high-tech car has different features, i.e., the Picco car has cast-aluminum parts and the BMT car has reinforced-nylon parts, both are almost identical in design. As for which came first, it's sort of like the chicken and the egg; it doesn't really matter.

Q I hate truing tires; do any of the manufacturers offer mounted/trued tires?

A You bet! Racer's Choice offers a variety of Arrow and GTS tires that are mounted and ready to go. The company also plans to introduce a new line of unique tires very soon. Also, Paris Racing offers a complete line of mounted (and trued!) Gomme tires for most popular cars.



BMT's 911 off-road car has nylon-reinforced parts and, unlike most $1/8$ -scale cars, it uses a belt drive and ball diffs.

Q Aerodynamics are very important in $1/8$ -scale racing. What's the most popular $1/8$ -scale on-road body?

A That's a tough question. For years, Team Paris/Associated has used the Elfin because it provides a lot of downforce and has excellent handling characteristics. Parma's* VDS Lola,

(Continued on page 78)

however, is making a strong comeback. It has a slightly lower drag coefficient, and this makes it a little more popular on longer tracks. Although GTP-style bodies have gained popularity (especially because of the new, taller heat-sink heads), I wish a company such as Andy's or Bolink would make an 1/8-scale Lotec.

Q Are "turbo" heads the wave of the future?

A I hope not! Although many people have started to use turbo heads, they're extremely difficult to tune, and this can be frustrating. They're also more expensive, because you have to buy the heads *and* the special glow plugs that go with them.

Q I love gas racing, but I've never been to an international or national event. Are they as great as they sound?

A Nope; they're 100 times better! There's nothing like a major race! It's the experience of a lifetime! If you can't attend such events, why not look for videos of them? Speedline Distributing*, for example, offers an excellent one of the '91 IFMAR World Champs.

Q Several new 1/8-scale gas cars have been introduced in the U.S. recently. Will there be more?

A As a matter of fact, *several* new cars will be introduced very soon. PB Racing's* updated Phoenix will be joined by the all-new Diamond car, and the legendary Serpent car will soon have a brother with an as-yet unknown name.

Q Where will the '92 ROAR 1/8-Scale Nats be held?

A This year's Nats will be held in Albuquerque, NM, and it may be the largest, most-celebrated race in ROAR's 25-year history—no kidding! This race will be unbelievable! Stay tuned for details.

Q Why aren't there more permanent 1/8-scale racing facilities?

A Gas-car racing has just started to grow in this country. Although there are hundreds of grass-lined 1/8-scale racing facilities in Europe—where the sport has been popular for a while—there are, as yet, only a few here. Such tracks also require a lot of space—space that many hobby shops can't afford. A new 1/8-scale track has just opened in Dallas, TX, and it will be the site of this year's Texas Biggie.



Team Paris/Associated has a lot of faith in the Picco Genesis F1. This team is the one to watch at the '92 ROAR Nats!

Q Does having more ports in the engine cylinder sleeve mean that the engine will be faster?

A Not at all. Many factors determine an engine's top speed, but the number of ports isn't one of them. Porting determines how the combustion chamber is "scavenged," i.e., how the air moves through the engine. An engine with a few large ports often (but not always!) has slightly higher rpm. In an engine that has

many small ports, the fuel/exhaust exchange is much more rapid, and this enhances low and mid-range torque.

Q Why is *Car Action* the only magazine that provides such great coverage of all the big races and the top cars as well as informative articles and columns such as "Nitro News"?

A Because we care about R/C racing and, quite frankly, because we have the best nitro burnin', tire spinnin', gear grindin', happenin' magazine on the entire planet. Oh, sorry...I got a little carried away!

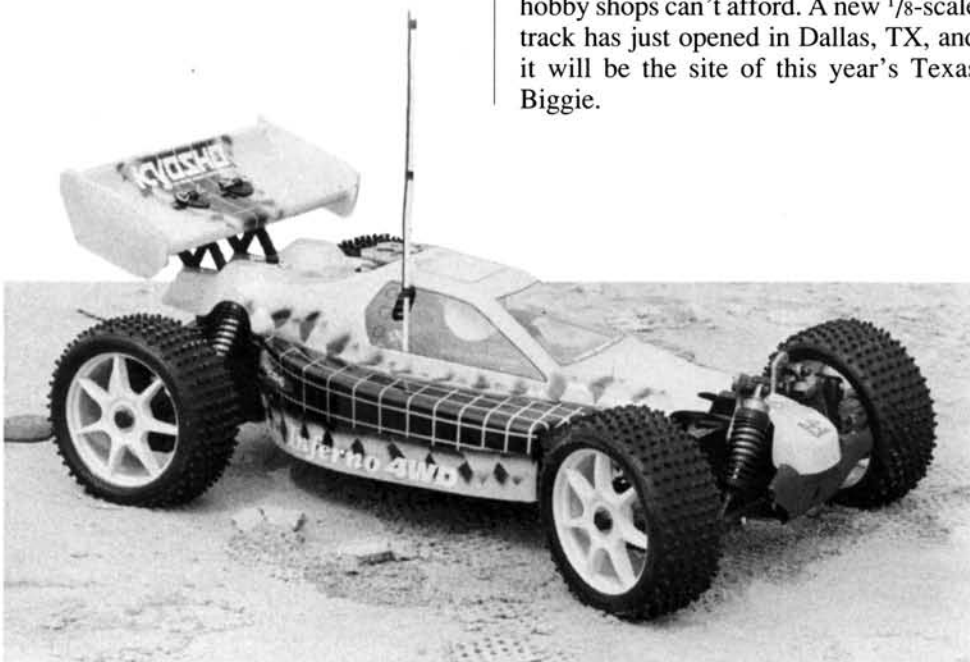
Q Why are so many manufacturers offering gas-powered cars and trucks now?

A The cost of manufacturing a gas-powered car is often much higher than that of producing an electric car, and this may have initially worried some of the manufacturers. Now that most of them have realized the sport's potential, they're embracing the possibilities.

Q Will more 1/10-scale gas cars and trucks be offered in the future?

A Yes, indeed, there will. In addition to its already competitive line of 2WD Nitro 10 cars and trucks, Schumacher* will offer a new 4WD truck. (I hope that it will be powered by the potent Irvine* 15.) Also, OFNA, maker of the Pirate, will offer a new 4WD "mini" Pirate that will have a shaft drive and a disk brake. Finally, listen to this! The people at BMT

(Continued on page 100)



Kyosho's new Inferno picks up where the Turbo Burns left off. It's a full-blown racer with three diffs and a dual brake system.

Makin' Tracks



GETTING STARTED in a new hobby can be frustrating. Newcomers often have their enthusiasm doused because they haven't learned all the little tricks and techniques that can help them overcome the many pratfalls. Fortunately, most of the people in the R/C hobby are friendly, open and glad to share their knowledge and experience with beginners.

Well, beginners unite! In this two-part article, novice R/C car modeler Bob Carpenter shares his first building/driving experiences to let you know that you're not alone. In Part I (July '92), Bob assembled and tested a Tamiya* Nissan King Cab. This month, he shares his impressions of how the truck handles and, more important, his enthusiasm for the R/C hobby.

beginner's

KING CAB

by BOB CARPENTER

Although I haven't competed in an organized race yet, I have driven my Tamiya Nissan King Cab on a bona fide R/C off-road racetrack! I had played with the truck for hours, but I still wasn't prepared for the precision re-

quired to drive it on a track. Just grabbing a handful of throttle and keeping the truck off the walls was no longer good enough. I had to learn the exact point at which the truck would complete its skidding apex.

TRICKS OF THE TRACK

When I was romping in a dirt lot, I was comfortable with the truck set up so that it oversteered, i.e., its rear end slid out first during cornering. I soon discovered, however, that it's important to

"My many driving experiences with the King Cab have been positive ones. The truck is easy to build, easy to dial-in and easy to drive. Although it isn't a thoroughbred racer, the King Cab is far superior to many low-buck entry-level R/C trucks, and it's much more versatile than most monster-truck replicas".

continually fine-tune the steering through the turns. Quick reflexes and a soft touch are critical!

To set up the car to oversteer, I angled the tops of its front wheels inward slightly (negative camber), and I set the rear wheels so that they were perpendicular to the ground (0 degrees of camber). I also mounted wide and narrow pre-load spacers on the rear shocks and narrow spacers up front. This put more weight on the front tires and less on those in the rear so that the truck had forward pitch.

On the track, this loose condition made it difficult to control the truck. To balance the weight distribution, I removed the wide spacers from the rear shocks (the spacers have slits in them, so they can be pulled off easily), and I left the narrow ones in place up front and in the rear. With just a touch of understeer, i.e., the front tires slid first in the turns under power, the truck's handling was more predictable, yet I could still chop the throttle at the apex and bring the rear end around.

The rubber boot that covers the mechanical speed controller failed to survive my test runs. It developed a tear, and dirt got under it and fouled the controller's contacts, causing erratic performance. A virtual

bath in motor spray cleaned the controller, but the after-market cover that I bought (it looks like a balloon) doesn't fit nearly as well as the stock version.

RUN TIMES TO RACE

I quickly learned the value of having at least one extra battery pack on hand—whether at the track or in the backyard. My Tamiya 1400mAh SCR racing pack usually lasts 10 minutes when I run the truck on full power—not bad. My after-market pack usually lasts only about 8 minutes. At first, I was frustrated by these run times because it took 15 minutes to charge the packs using my MRCRB-485 quick-charger, and I didn't like to wait for them. Then, I learned more about batteries—from a racer's perspective—by hanging out at the track.

Racers aren't interested in taking pleasure cruises with their vehicles, so they aren't concerned with long run times. Instead, they want maximum power for speed. When the race is over—4 minutes and one lap later—leftover power is a sign of inefficiency. Battery manufacturers try to produce packs that will provide a lot of power in a short time. I've decided to buy another Tamiya battery for longer run times and, with three packs,

I'll never have to wait for one to finish charging.

During all my battery swapping, I discovered a minor problem with Tamiya's battery-mounting system. The tube-like holder doesn't run the width of the truck. Instead, there are short tubes on each side and nothing between them. Whenever I installed a pack in the holder, I had to wiggle it so that it would line up with the other tube. Mud complicated matters. A straight-through tube would be a big improvement. Also, the plastic clip that's supposed to hold the battery in place often failed to do so.

MASTERING THE TRUCK

After reading about my episodes, you probably think that my driving skills are somewhere down near inadequate, or that I'm just brain dead. Not true! I admit that, for the first week, I was unaware that the truck had a speed setting below wide open, and this guaranteed that every wrong turn would become a major incident. I soon settled in, however; I tamed my hormone-driven rage for speed by developing throttle-finger finesse through purposeful practice. No longer did I blast from one corner of the lot to the other; rather, with my newfound "maturity," I laid out apex markers and figure-8 tracks. (I did the latter to ensure that I had mastered the steering controls from all directions.) I don't smack walls anymore, and I no longer feel embarrassed when I drive at the track during open practice.

I haven't signed up to race, though, and there are two reasons for my failure to do so: I'm not quite ready to pit my skills against those of other

racers and, when I compare the King Cab with other race trucks, e.g., Associated's RC10T, I feel outclassed. Although such trucks only cost a little more, they seem more sophisticated, i.e., they have more metal parts, and they seem more like serious race trucks. You do, however, have to buy an electronic speed controller to use with these trucks, whereas the Tamiya comes with a mechanical controller.

For all-around enjoyment, the Nissan King Cab has the edge. It isn't overly sensitive to suspension changes and its technology is simple and straightforward, so you can have fun driving it even if you aren't an expert technician.

Although many of its parts are plastic, the truck is impressively durable. When I tell you that the truck's steering arm broke I smacked the truck into a concrete wall, you must be aware that there were at least 11 previous smacks before the fatal blow! I can't count how many times I chuckled while I watched the truck crash into—or off of—something, and I thought, "I don't know how this truck can take it." (Maybe I should also point out that I never *intentionally* ran into anything!)

My many driving experiences with the King Cab have been positive ones. The truck is easy to build, easy to dial-in and easy to drive. Although it isn't a thoroughbred racer, the King Cab is far superior to many low-buck entry-level R/C trucks, and it's much more versatile than most monster-truck replicas. It's a viable player in the field of R/C trucks.

**Here's the address of the company featured in this article:
MRC/Tamiya, 200 Carter Dr., Edison, NJ 08817.*

*Quick-change
artist*



Bolink

ELIMINATOR

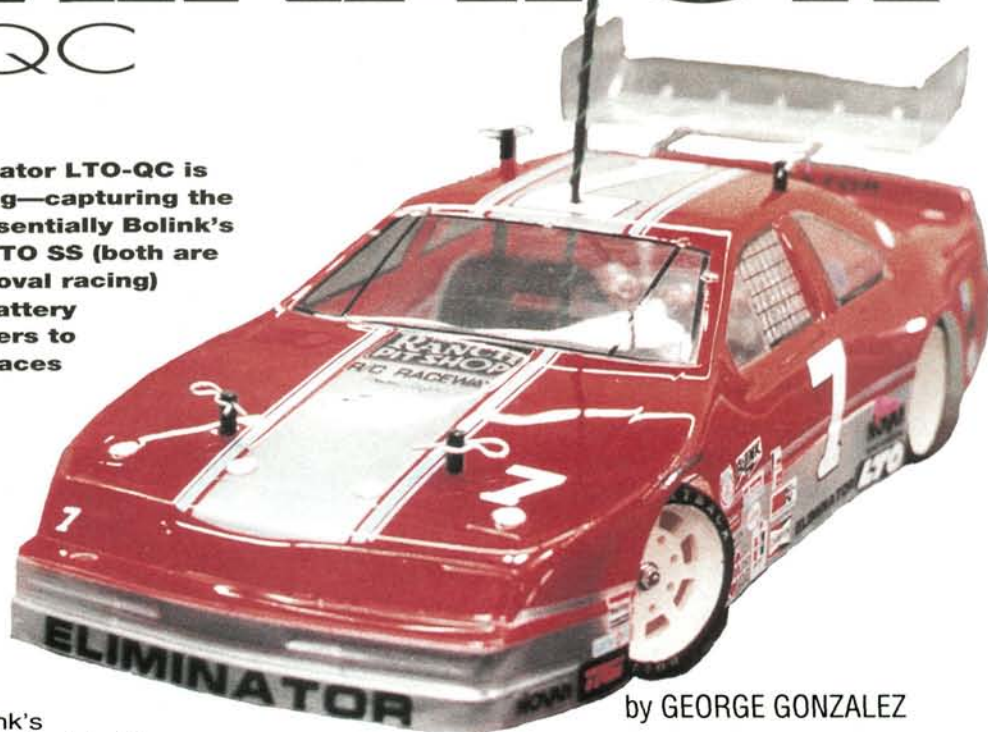
LTO-QC

BOLINK'S* NEW Eliminator LTO-QC is designed for one thing—capturing the A-Main. The QC is essentially Bolink's top-of-the-line Eliminator LTO SS (both are designed for left-turn-only oval racing) with a new quick-change battery mechanism that allows racers to compete in enduro races (races that run longer than the average 4 minutes). With able pit crews, racers can pull in for a pit stop and be back in the action with a fresh battery pack in seconds.

THE KIT

The LTO-QC has a graphite chassis to which the front axle plate, radio tray and T-plate are attached. Bolink's new Aluma-Lite rear pod is standard in this kit; it replaces the motor mount, the left axle carrier and the rear brace. The Aluma-Lite pod is stronger, lighter and is a better heat sink; it also centers the motor for better stability and has a set of nylon ride-height adjusters with three settings, which makes the kit even more versatile.

The LTO-QC kit comes with a set of Bolink's Fast Track tires mounted on one-piece rims, a graphite axle with a ball differential and a fully



by GEORGE GONZALEZ

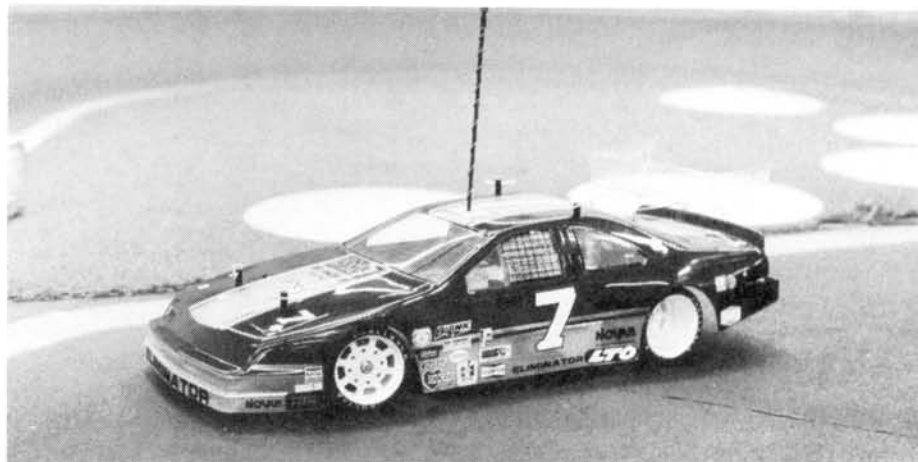
adjustable front suspension with Bolink's new Pro front springs. The new springs have a larger coil diameter that makes their action more consistent and allows for increased suspension travel. The front suspension also allows you to make minor caster and camber adjustments.

The kit also includes a full set of bearings, Bolink's unique dual-shock rear suspension (with a silicone-filled damper bar to eliminate rear-end

"The LTO-QC's assembly is a relatively simple...but I strongly recommend that you read the instruction manual thoroughly and take your time."

"chatter"), a set of body posts, Bolink's Adjust-a-Link steering linkage and a new, 6-inch-long, ribbed superspeedway wing with all the hardware you'll need to install it.

The most significant addition is the quick-change battery mechanism. It looks like two upside-down RC10 battery trays with two graphite braces and a battery-retaining plate that slides back to allow the pack to drop out. A rubber O-ring that's attached to the plate returns it to its "locked" position. The mechanism works flawlessly and adds only 1/8 ounce to the car's weight. My kit also came with a few optional hop-up parts: a graphite nerf wing, a rear shock extension bracket that



ELIMINATOR LTO-QC

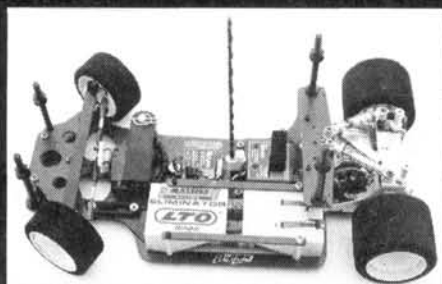
provides a better shock angle and a full set of Pro front springs. Because of my passion for Ford cars, I used an Associated* '91 Thunderbird body.

ASSEMBLY

The LTO-QC's assembly is a relatively simple, 20-step process that experienced R/C racers can finish in one evening, but I strongly recommend that you read the instruction manual thoroughly and take your time. The manual is straightforward and includes

exploded views for each step of assembly, black-and-white photos of the completed chassis, a full-size hardware identification chart, tips on setting up battery packs for the quick-change system, a list of replacement and hop-up parts and an extremely helpful page called "Racing Your LTO" that offers information on caster and camber, side-roll and ride-height adjustments, front and rear spring tuning, tire compounds and wing adjustment.

(Continued on page 88)



The Eliminator QC, which is based on the popular LTO SS, comes with Bolink's simple, effective, quick-change battery-mounting system. This narrow car is suitable for both extended enduro racing and competition in the standard classes.

Manufacturer Bolink

Type On-road
Scale 1/10
Price \$284.95

DIMENSIONS

Overall length 13.25 inches
Width 7.625 inches
Wheel base 10.125 inches
Front track 6.375 inches
Rear track 5.75 inches

WEIGHT

Gross (with battery)
2 pounds 10.125 ounces

BODY Not included

SPECIFICATIONS

CHASSIS

Type Pan
Material Graphite

DRIVE TRAIN

Primary Pinion/spur
Transmission Direct drive
Differential Ball diff
Bearings/bushings Bearings

SUSPENSION

Front: Floating kingpin
Damping Coil-springs
Rear: T-plate rear pod
Damping Dual coil-over shocks and silicone tube stabilizer

WHEELS

Front One-piece plastic
Dimensions
(DxW) 1.875x1.25 inches
Rear One-piece plastic
Dimensions
(DxW) 1.875x1.5 inches

TIRES

Front/Rear Low-profile foam

ELECTRICS

Motor, Battery,
Speed Controller Not included

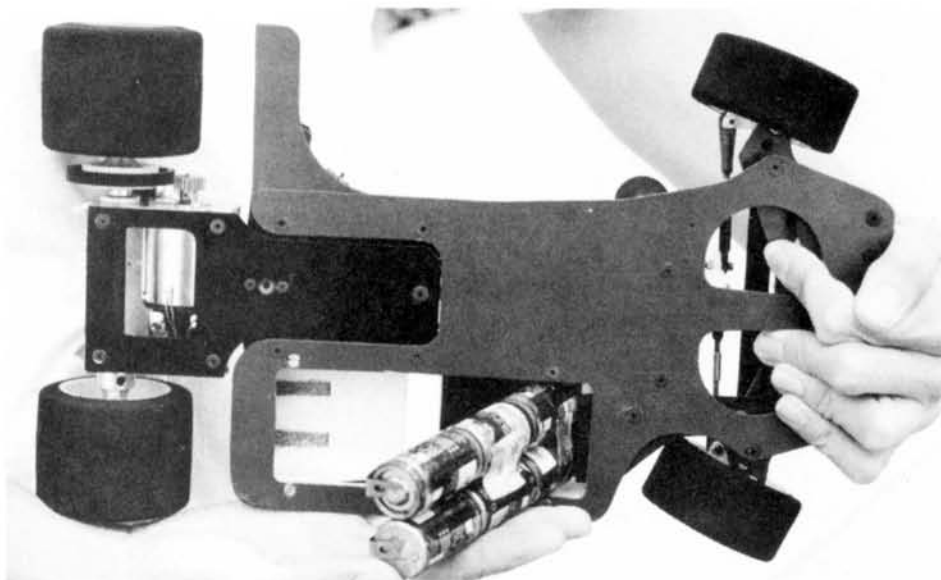
OPTIONS AS TESTED

Airtronics XL-2P radio and 94102 servo, Novak 410-M5 ESC, Novak NER 2X receiver, Peak Performance 15-turn, double-wind modified motor, PTI 1400 SCR 6-cell stick battery pack, Kimbrough 1/8-scale servo saver, Bolink BL-5201 nerf wing and an Associated '91 Thunderbird superspeedway body.

COMMENTS

The Bolink Eliminator LTO-QC is an updated version of the race-proven Eliminator LTO. The new quick-change battery mechanism works flawlessly; with practice, a 5-second battery change is possible. The new rear pod centers the motor for optimum weight placement, and besides being lighter and stronger, the pod is a terrific heat sink! It seems to me that the part of this car that most racers will see is its rear end. Catch one—if you can!

ELIMINATOR LTO-QC



To make lightening-fast pit stops during enduro races, just pull back the graphite battery retainer (to allow the pack to drop out from underneath the chassis), slap in a new battery pack, and drop the car back onto the track.

PERFORMANCE

The LTO-QC didn't include electrics, so I added a Novak* 410-M5 ESC, a Novak NER-2X receiver, a PTI* 1400 SCR 6-cell stick battery pack, a Peak Performance* 15-turn, double-wind modified motor, an Airtronics* XL-2P radio with a 94102 servo, and a Kimbrough* 1/8-scale servo saver.

To test the car, I headed for the Yorba Linda R/C Speedway in Yorba Linda, CA. This indoor track is an awesome banked oval where high speeds are the norm—the perfect testing ground. I wanted to take it easy and get used to the track, but there was a lot of traffic that day, so I had to “get a grip” very quickly. I was truly amazed at how well the car handled

without any adjustments, although it tended to oversteer coming out of turns at high speeds.

To alleviate this problem, I made adjustments until I achieved the proper balance of speed and handling. I replaced the front springs with the Pro extra-heavy purple springs, filled the rear shocks with 60WT shock oil, tightened the right front spring; loosened the diff slightly, moved the wing back and bent it up about 1 degree, adjusted the right front wheel so that it had

2 degrees of negative camber and the left front wheel so that it had 2 degrees of positive camber, and applied

Revtech* Super Track Bite to the tires.

After I made these adjustments (one at a time, mind you!), the car ran like it was on rails. It hugged the inside line through the corners and tracked well on the straightaway; when the LTO-QC sped

I must admit that the performance of the Bolink Eliminator LTO-QC amazed me! It can run well on any track with very little effort.

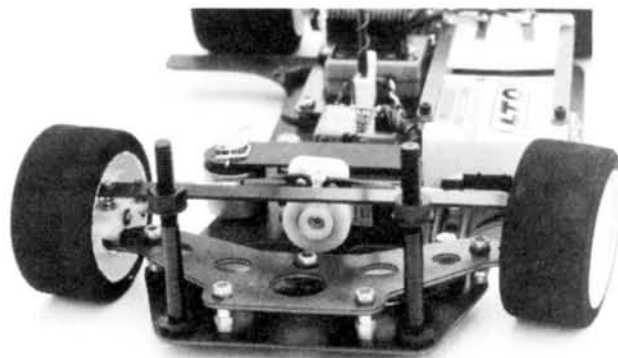
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by, all I saw was a blur. The quick-change battery mechanism worked very well and held the battery firmly in place, even after high-speed crashes. My brother-in-law Tony was able to change the battery pack in about 8 seconds. With practice, I'm sure that a 5-second battery change would be possible.

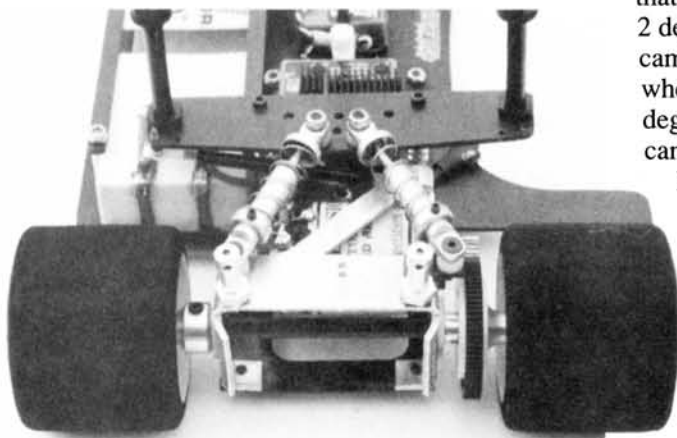
CONCLUSION

I must admit that the performance of the Bolink Eliminator LTO-QC amazed me! It can run well on any track with very little effort. The quick-change system adds very little weight to the car, and the added versatility will enable racers to be competitive in

PHOTOS BY GEORGE GONZALEZ



The QC's front suspension incorporates a graphite plate that allows for caster adjustment. A graphite brace helps to keep the floating-kingpin suspension in the proper position.



Bolink's Aluma-Lite one-piece rear pod is standard on the QC. It centers the motor for better weight distribution, and it acts as an efficient heat sink.

both enduro and standard races. The new Eliminator is a refined racing machine that could be your ticket to the A-Main.

**Here are the addresses of the companies mentioned in this article:*

Bolink R/C Cars Inc., 420 Hosea Rd., Lawrenceville, GA 30245.

Associated Electronics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

Novak Electronics Inc., 128-C E. Dyer Rd., Santa Ana, CA 92707.

PTI, P.O. Box 4648, Winston-Salem, NC 27115.

Peak Performance, 1362 E. Edinger, Bldg. B, Santa Ana, CA 92705.

Airtronics Inc., 11 Autry, Irvine, CA 92718.

Kimbrough Products, 1420 E. St. Andrews Pl., Unit F, Santa Ana, CA 92705.

Revtech R/C Products, 7401 White Ln., #19, Bakersfield, CA 93309. ■

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FERRARI

(Continued from page 39)

fuel. After that, you can slowly lean out the carb. Make sure that the setting isn't too rich, however. This will result in a lot of blue smoke and sluggish performance, and it might prevent the engine from being broken in properly.

After a minute of low-speed driving to warm up the engine, I stabbed the throttle to full speed to see what the Ferrari could do. For a car of this size with a .12-size engine, acceleration was impressive. Its top speed was comparable to that of a 1/10-scale electric car equipped with a mild modified motor. The car's handling was sound, with just a trace of understeer, and the stock foam tires gripped the paved surface well.

I ran the car for about 12 minutes on one tank of fuel; that's a decent run time, especially if you're used to running electric cars. Refueling the Ferrari is a little hard because you have to remove its body to access the tank. That's OK with me, though, 'cause I don't plan to race this car—just have fun with it.

(Continued on page 100)

TEAM SHADOW RACING

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FERRARI

(Continued from page 94)

SUMMARY

If you're an F1 fan who digs R/C, then the Kyosho Ferrari 643 F1 will provide you with hours of enjoyment—whether you choose to blast it around or display it on a shelf. Those who appreciate scale realism and detail will appreciate this car's accurate, functional suspension, its sleek body and wings and the roar of its engine. Regardless of your preference, this kit has something for you.

*Here are the addresses of the companies mentioned in this article:

Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.

Airtronics Inc., 11 Autry, Irvine, CA 92718.

Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036.

Tekin Electronics, 970 Calle Negocio, San Clemente, CA 932672.

TURBO SCORPION

(Continued from page 56)

keep this classic car in pristine condition, so I only plan to drive it to the market on Sundays.

The Scorpion performed very well at my local dirt oval. Although the track desperately needed to be groomed, the Scorpion ignored the dozens of small bumps. It handled the curves flawlessly, and I quickly got used to driving it. Although the stock 540 motor isn't as fast as a 9-turn quad, the battery seemed to last forever.

The Turbo Scorpion is a treat to drive—and watch. If you ever see one for sale, grab it for the fun of it!

*Here are the addresses of the companies mentioned in this article:

Cox Hobbies Inc., 350 W. Rincon St., Corona, CA 91720.

Tower Hobbies, P.O. Box 9078, Champaign, IL 61826.

Boca Bearing Co., 7040 W. Palmetto Park Rd., Ste. 2304, Boca Raton, FL 33433.

NITRO NEWS

(Continued from page 78)

might offer a 1/10-scale on-road car with independent suspension in the U.S.

Q: Will ROAR release rules for 1/10-scale gas racing soon?

A: Although ROAR has worked hard to develop impartial rules and guidelines, it may be a year before we learn what the formats for 1/10-scale on-road, off-road and monster-truck racing will be. EFRA,

(Continued on page 142)

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b y G A R T H F I N L E Y



O

A NEW TRUCK is taking Europe by Storm! Schumacher Inc.*has released its newest competition truck—the successor to the Shotgun and the cousin of the Cougar II. The Storm's differential, shock absorbers, body and friction clutch are new, and all the suspension components are molded of Schumacher's Performance Engineered Polymer (PEP). The light, bulletproof Storm is a winner right out of the box.

COMPETITION COMPONENTS

Off-road truck racing has become very popular in the U.S. and in England. The Storm was designed by factory engineers in England and team drivers in the U.S., and they used many of the Cou-

R

The staggered-rib fronts and the mini-pin rears will provide traction on a variety of surfaces. The front end offers a number of adjustments that are characteristic of Schumacher's new generation of off-road vehicles. The front bulkhead allows you to adjust the caster and rake angle between 15 and 30 degrees.

The lower A-arms and the shock tower are securely mounted

M

ment over previous shock designs. They provide the front suspension with plenty of travel and smooth damping.

The front suspension also has strong turnbuckles and ball cups, so it's easy to make toe and camber adjustments. The front wheels are bolted to axles that are supported by large (8x16x5mm) ball bearings mounted inside the steering blocks.

The Storm's rigid, red-anodized aluminum-alloy chassis tub minimizes chassis flex. The body is very attractive, and it will also fit Losi and Associated trucks. The Storm features a stadium-truck body that's lower than most. I



FEARSOME FORECAST

gar II's best features.

The Storm rests on 2.2-inch, one-piece wheels and high-quality tires.

on the front bulkhead, and they have an abundant number of mounting holes so you can mount the shocks at many angles.

Schumacher's impressive new Vari Shocks are a great improve-

couldn't do the body justice, so I delivered it to Kurt Davis of Dude Inc.* Radical paint job, isn't it?

(Continued on page 107)

SPECIFICATIONS

Manufacturer Schumacher
Type 2WD racing truck
Scale 1/10
Price \$349.95

DIMENSIONS:

Overall length 17 inches

Width 12.25 inches
Wheelbase 11 inches
Front track 9.75 inches
Rear track 10.125 inches

WEIGHT:

Gross (with battery) 3 pounds,
 14 ounces

BODY:

Type Stadium truck
Material Polycarbonate

CHASSIS:

Type One-piece tub
Material Anodized-aluminum alloy

DRIVE TRAIN:

Primary Pinion/spur
Transmission Belt drive
 (2.43:1 ratio)
Differential Externally adjustable
 ball diff
Bearings/Bushings Ball bearings

SUSPENSION:

Type (f/r) Independent A-arm with
 upper control links
Damping (f/r) Oil-filled, coil-over
 shocks with adjustable damping

WHEELS:

Front: Type (f/r) One-piece
 molded plastic
Dimensions (f/r) 2.2x2.0 inches

TIRES:

Front Staggered ribs
Rear Mini-pin spikes

ELECTRICS:

Motor Not included
Battery 6- or 7-cell pack
Speed Controller Not included

OPTIONS AS TESTED:

Airtronics* 94152 servo and receiver;
 LRP LE-25A speed controller and LRP
 White-Dot/E modified motor; 7-cell
 Sanyo* 1700 SCE battery pack.

COMMENTS:

Schumacher's Storm competition truck is race-ready, and it can compete on the highest levels. Every section of the Storm is well-designed; it's a big improvement over its predecessor, the Shotgun. Be sure to pick up a no. 1 screwdriver to make assembly easier.

(Continued from page 103)

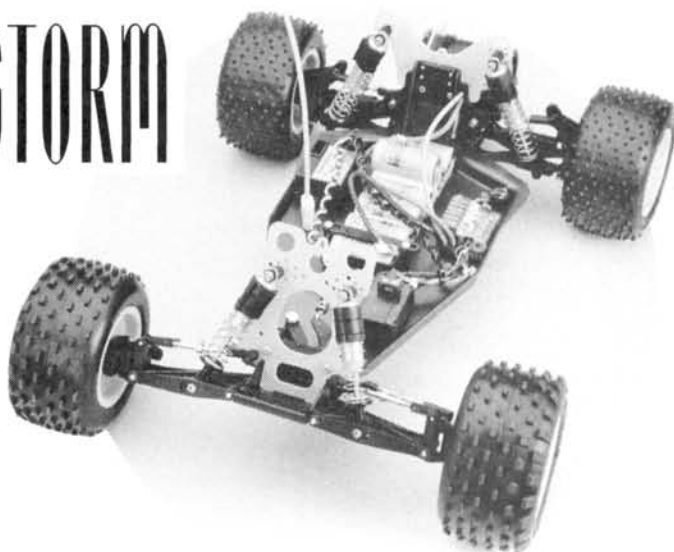
Schumacher has strengthened the Storm by molding all of its suspension pieces of the PEP material. This new polymer is incredible. Under normal loading conditions, suspension parts won't flex, wear, or become sloppy. PEP is less brittle, twice as rigid and three times as strong as the plastic material used on previous Schumacher cars. Another advantage of PEP is that it can be molded more precisely, so the parts have tighter tolerances.

The Storm's rear section is where Cecil Schumacher and head engineer Victor Ababurko have most clearly demonstrated their design talents. The belt-driven transmission features Schumacher's newly designed ball-differential and a new friction clutch. (These parts also come with all of the Cougar II kits; for further details, see our review of the Cougar II in the May '92 issue.)

Splined drive shafts transmit power to the rear axles and wheels. They act in a telescoping manner when the suspension is compressed. The Cougar II Team Car features new roller drive shafts that will also fit the Storm. The splined shafts are the industry standard, but if you want even better performance, add the roller shafts; they allow the rear suspension to act more freely when power is applied, and they improve the truck's performance on rough tracks.

The Storm's rear suspension is essentially the same as the Shotgun's. Medium-length lower A-arms are included in the kit. Long or medium-long A-arms are also available so that you can adjust the wheelbase in 1/4-inch increments. The A-arms hinge on larger diameter pins (1/8-inch) that are less likely to bend. Both the rear bulkhead and the hub carriers have been improved to further reduce flex. Like the front suspension components, all the rear suspension pieces are molded out of PEP. Finally, the rear A-arms and shock tower

STORM



offer a variety of mounting positions so that you can adjust suspension stiffness, travel and ride height.

ASSEMBLY

Although the screws in the kit look like they have standard Phillips heads, they don't, so I recommend that you buy a screwdriver with a no. 1 tip before you assemble the Storm. If you can't find one at your local hardware store, Schumacher sells them. To reduce friction, apply a small amount of oil to the threads of the screws.

turning the spur gear. The diff should feel very tight, and the counter action should rotate freely.

Pay special attention to step 7, and warm the parts (T030, T1156 and the drive-shaft ends) with hot water before you install them. Installing the U-joints is challenging, but you'll become an expert after a few attempts.

Step 14 gives a brief description of how to set the belt tension, but I recommend that you set the eccentric cams so that the reference mark is oriented



TRANSMISSION

The instructions provide excellent support for the diff assembly. When the diff has been assembled, insert it into the transmission housing along with the belt, the upper shaft and the slipper clutch. To set the diff, hold the output shafts and rotate the upper shaft by turning the spur gear with the slipper clutch locked up. Tighten the adjustment screw until it becomes very difficult to slip the diff while

with only one hole between it and the uppermost mounting screw. The picture shown in step 12 further illustrates where I believe the cams should be set.

SUSPENSION

The rear suspension assembly is straightforward. The hinge pins fit freely and help the suspension to operate smoothly. Pay special attention when you install the rear pivot blocks and

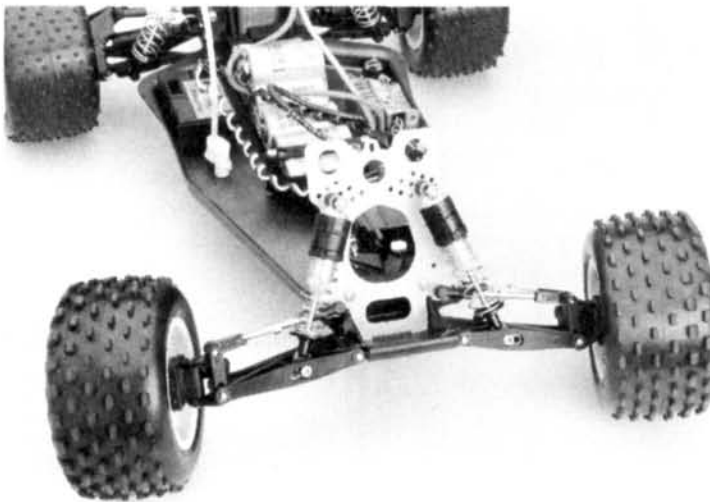
STORM

the spacers that accompany them. Use the four white nylon spacers for both the anti-squat and the rear toe adjustment.

The front end is easy to assemble. Be sure to apply oil and use the screwdriver with a no. 1 tip; it will help you to install the bearing retainers and the panhead screws that fix the front bulkhead's rake angle.

SHOCK ABSORBERS

The Storm comes with Schumacher's new Vari Shocks, which have some appealing features. Their pistons can be adjusted to control damping. With 10WT oil in the shocks, you can adjust the piston to simulate 10WT, 20WT, 30WT, or 40WT oil.



The Storm features Schumacher's new Vari Shocks and new fiberglass shock towers. To adjust front-end rake, put small spacers behind the shock tower.

Instead of using a diaphragm seal for volume compensation, the Vari Shocks have foam sections at the bottom that allow them to operate more consistently and prevent pressurization during stroke displacement. The foam also traps air bubbles, so the oil is less likely to foam. The shocks are hard-anodized, include Teflon-filled pistons, and are very easy to build. They rarely leak, and they provide very consistent damping.



Above left: The friction slipper clutch is one of the Storm's best features. It uses PTFE clutch disks for durability and smoothness. Above right: Yes, the LRP LE-25A speed controller comes wrapped in shrink-wrap. The external potentiometer is the torque-control adjustment.



LRP POWER

Jürgen Lautenbach is one of Schumacher's top drivers; he proved himself by winning the 2WD Worlds warm-up race and making the A-Main at the Worlds. His company, Lautenbach Racing Products (LRP*) is producing a line of motors and an electronic speed

I do know that the White-Dot/E motor really screams and that it's intended to be used as a 7-cell truck motor or a 6-cell car motor.

The LE-25A ESC worked very well in the Storm. I really like being able to see how the current limiter is set. The plug-in potentiometer allows for current settings between 0 and 100 amps. The number represented on the potentiometer will give you the actual current rate that the motor can consume. You can use an optional receiver pack with the LE-25A if you desire. It can easily be used with FET servos, and it weighs only 1.25 ounces. This is the first ESC I've ever used that didn't drift from its neutral setting, and the easy-to-adjust brakes were very predictable. This speed controller just felt natural for my driving style.

The motor and the speed controller remained very cool throughout the run. LRP quickly gained my respect because their products perform well and are competitively priced.

DRIVING IMPRESSIONS

It was finally time to release all my anxieties and test-drive the Storm. I headed out to my local track, sprayed the surface with water and unleashed the Storm. The track had loads of traction and plenty of surface variation, so I could really give the truck a true test. I seated the clutch disk and adjusted both the clutch and the torque limiter on the ESC.

Then, I cruised around, setting my radio trims and jamming on the throttle.

The first thing I noticed was how well the Storm held its line through the turns. It turns in quick and sticks! Low-speed steering was tight and the Storm acted neutral in the high-speed sweeping turn. The new Pro Diff definitely did its job; it provided excellent drive compensation when the car exited turns under power.

Schumacher suggested a suspension setup that I'd like to pass on to you; they recommend it as a starting point on any track:

- **Front shocks**—30WT Associated* oil; 4 holes open; softest kit springs; no. 1 A-arm hole; center shock-tower hole; upper camber link mounted in the extreme inside hole; steering link mounted in the hole closest to the chassis center line.

- **Rear shocks**—20WT Associated oil; 4 holes open; softest kit springs; no. 3 A-arm hole; middle hole in the middle row on the shock tower; upper camber link mounted in the lower hub-carrier hole; upper, middle hole in the bulkhead; no anti-squat washers; thin black plastic washers for toe spacers; shock tower mounted in its lowest position.

CONCLUSIONS

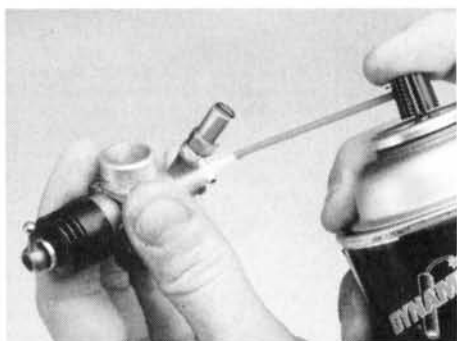
The Storm competition truck can run with the best in its box-stock form. It turns well and can react aggressively, owing to its

(Continued on page 152)

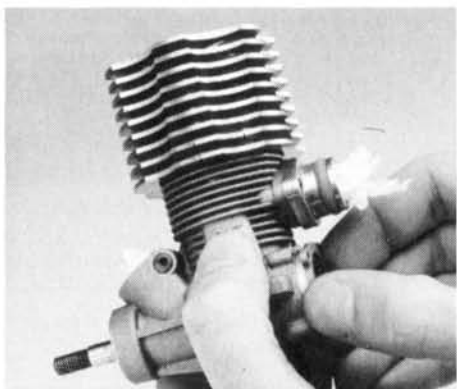
HOW TO Rebuild Gas Engines



1 Before you take your engine apart, plug the exhaust and carb openings with paper towels and gently remove loose dirt with a soft paintbrush.



2 Next, remove the carb; be careful not to let any debris fall into the engine. Plug the hole in the crankcase where the carb was with paper towels, wash the carb with a high-quality motor spray or denatured alcohol, and set it aside.

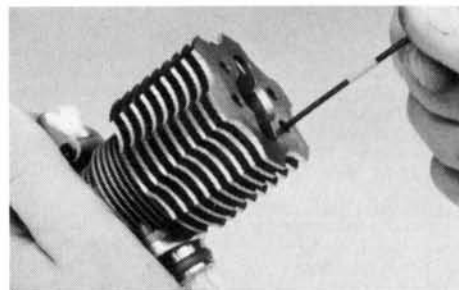


3 Remove the engine's backplate. Be careful: there might be a paper gasket between the backplate and the engine that's easily damaged. Clean the backplate and screws, and set them aside.

SO, YOU'VE been running your gas car to death. Even though your engine may need little more than a shot of fuel to run well, you should take care of your investment. It's a good idea to dismantle, clean, and inspect your engine after about a dozen runs. In this article, I'll show you—step-by-step—how to dismantle and rebuild your engine, and I'll point out a few things to look for that could prevent its untimely demise.

MAKE IT
SCREAM...
KEEP IT
CLEAN

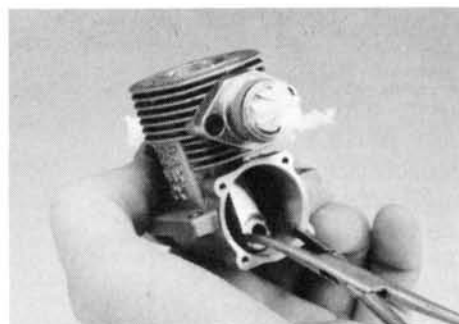
by JOHN HUBER



4 Now, you can remove the engine head. Carefully loosen the head bolts, and remove the head by twisting it slightly from side to side. Your engine may have a shim at the base of the head; don't lose it! Wash the head, bolts and shim (if equipped), and set them aside.



5 When the head is removed, you can see the top of the piston and the sleeve. The sleeve may have a notch in the rim so that it can be aligned with a pin in the case. If yours doesn't have an alignment notch, note the orientation of the ports on the sleeve and the case so that you re-assemble it correctly. Remove the sleeve by pulling up on its rim, or by pushing it up through the backplate opening.



6 With the sleeve removed, the piston has room to move side to side. Lift the bottom end of the connecting rod off the crankpin, and push the piston out of the top of the engine case. On some engines, it's easier to remove the rod from the pin when the piston is at top dead center (at its highest point); on others, the piston should be at bottom dead center. Be extremely careful when you move the piston up and down, because the sleeve isn't in place to guide it.



7 After you've removed the piston and the connecting rod, take the crankshaft out. Gently tap on the crank's threaded end, and push it out through the backplate's opening.



8 At this point, clean the engine's bearings by blasting motor spray into them while they're still in the crankcase. If the bearings feel notchy or wobbly after you've cleaned them, replace them.



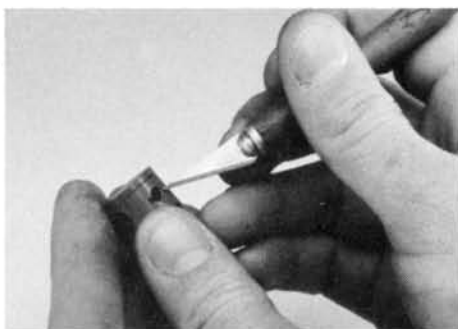
9 Look for vertical grooves in the piston and the sleeve. Some wear is normal, but look for large grooves or scratches; they'll reduce compression and cause the engine to run poorly.



10 Be sure that the connecting rod fits well to the crankpin and the wristpin. Any play or "egg-shaping" of the connecting-rod ends will ruin the engine almost immediately, so, if it's worn, replace it!



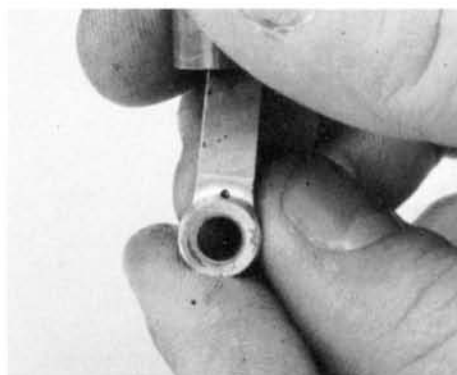
11 Spray LPS (or a similar oil) on the sleeve and insert the piston. It should slide very smoothly and meet resistance at the top of the sleeve. If there's little or no resistance, replace the piston and the sleeve.



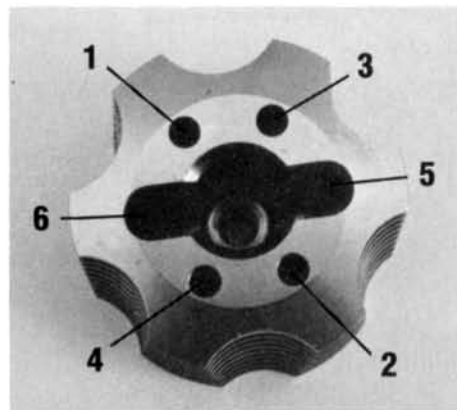
12 If the piston or the connecting rod needs to be replaced, you must separate them. Carefully remove the retaining clip on the side of the piston. Watch out; they love to shoot across the room! After you've removed the clip, simply push the wristpin out from the opposite side. (Use new clips for the wristpin when you re-assemble the engine.)



13 After you've cleaned and inspected all the parts, spray them with a little oil. Then, you can start to re-build the engine.



14 Some engines have an oil hole for the connecting rod's lower bushing; make sure that it faces the front so that fuel and oil lubricate the bushing while the engine runs.



15 Tighten the head bolts in the order shown. Start each bolt until it meets resistance, and then tighten the bolts across from each other until they're all firmly tightened. Don't use threadlock! Properly torqued bolts won't loosen.

Radio Control **Racer**

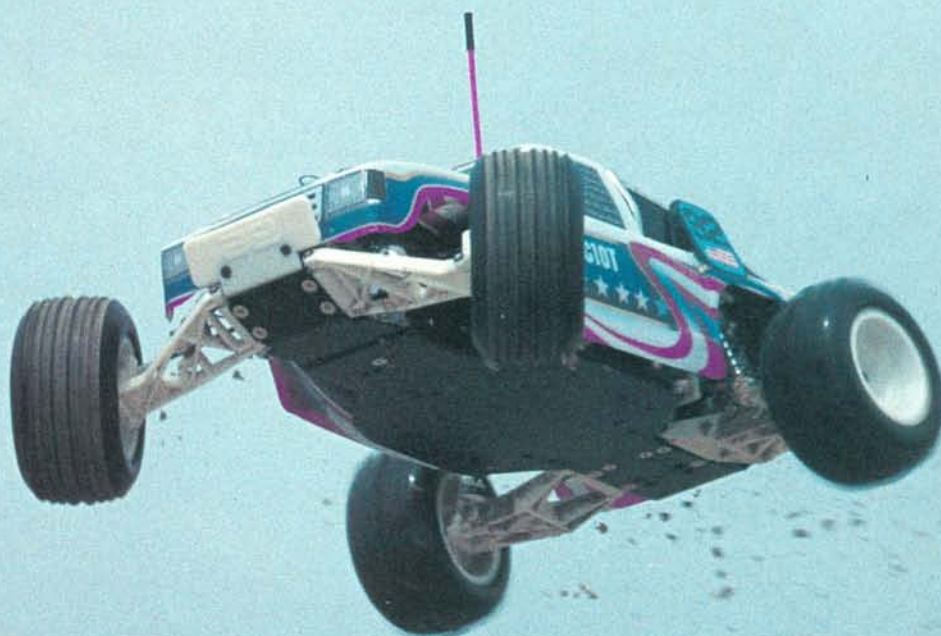
120
•R/C Car
Action's Truck
of the Year:
Associated
RC10T

128
•Speed Shop

131
•Build a Pit
Stop Radio

136
•Bill Campbell
Memorial
Enduro

147
•Track
Directory



ASSOCIATED

RC10T



**Radio Control
Racer**

ELECTION SEASON IS here and, even in the world of R/C, the majority rules. With ballots being cast in every direction, it's unusual for a candidate to emerge victorious with a huge percentage of the votes. This year's front-runner for *Car Action's* "Truck of the Year," however,

Radio Control
CAR ACTION

RC10T

by DEREK ARITA

BACK OF THE BEAR

did just that. Associated's* RC10T made good on its promises *before* the election (if only politicians could do the same), and it won by a landslide.



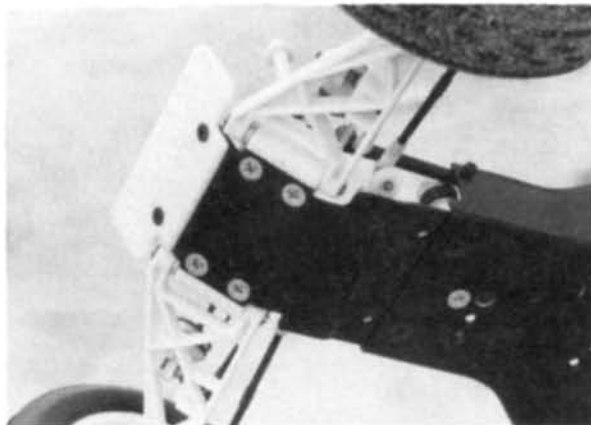
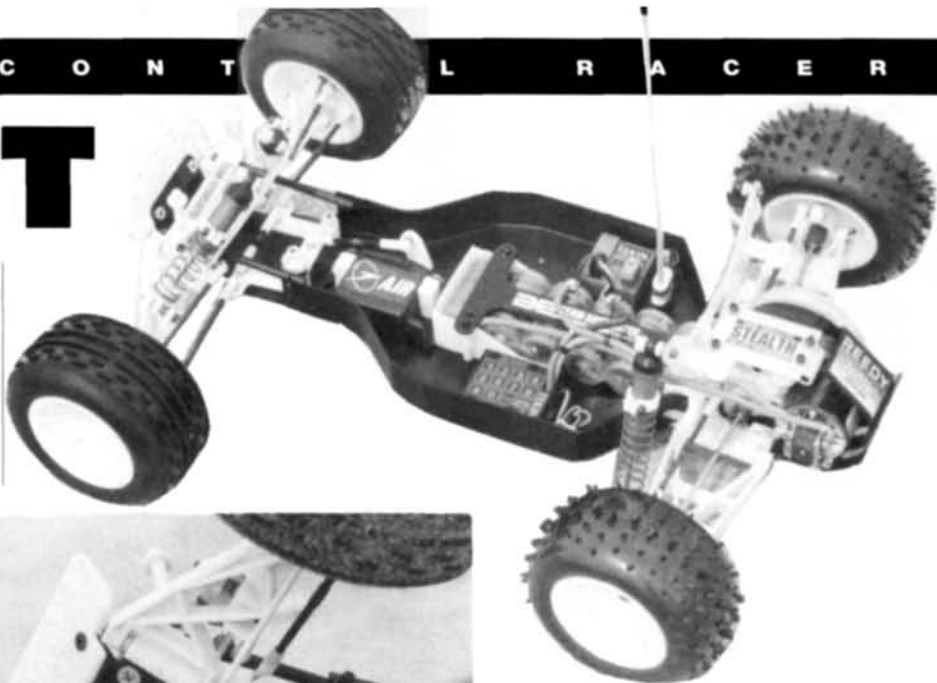
PHOTOS BY MIKE OGLE

RC 10T

Associated developed its premier stadium-meister based on the assumption that trucks should be faster and more agile than buggies. If this doesn't make sense to you, then you've been watching too many other types of truck! Don't feel bad though; at first, I was confused, too. Then the concept was explained to me: you take a chassis that works well (such as the Team Car), and you make it longer, increase its stance, give it large tires that provide more bite and design in some "mega-steering" and "mega-stability"—and...what do you think?

The RC10T was designed by Roger "Mr. Science" Curtis, Cliff "Moo Meister" Lett and Curtis "The Machinest" Hustung. When they started, they knew what the wheel dimensions and the chassis configuration would be, and they kept racing in mind while they performed the paper-to-parts engineering. Truck racers wanted steering, stability and all-out speed. Guess what they got?!

To improve steering response, the RC10T's front wheels are offset inwards over the kingpins. Its wide arms pivot on a narrow front nose plate, and this makes the car more stable in the turns and reduces tire scrub as the suspension moves from one extreme to the other. A redesigned front bulkhead accommodates the wide arms, and provides a strong base for the body-mounting posts. Wide arms are also used in the rear, again to increase stability. Increased toe-in helps to control the truck's impressive amount of steering.



A narrow nose plate accommodates the 10T's extra-long front arms. By using the rear set of mounting holes, Associated has lengthened the wheelbase.

To reduce friction and increase reliability, the truck uses dogbones, and it has a longer suspension travel. All this and ball bearings and turnbuckles throughout, too!

PAPERWORK

The RC10T's excellent instruction booklet has sharp, well-labeled photos. All the "how to's" and "where for's" are covered in the preface so that assembly can proceed without a hitch. There are even exploded-view diagrams of the Stealth tranny, the front end, the rear end, the shock assembly and the wheels. (Associated does everything but offer to build it for you!)

Along with the precise, well-written

The RC10T is more than a Team Car with big tires and rims. It has made it to the winners' circles throughout the world, and it truly deserves to be named Car Action's Truck of the Year.

TRUCK OF THE YEAR

directions and "Cliff Notes," there are labeled pictures of the hardware that enable you to identify the parts easily. With some care, even beginners will have few problems assembling this stadium truck. The last few pages of the manual are filled with tips on how to maintain and adjust the truck as well as on how to charge battery packs—invaluable info for beginners and veterans alike.

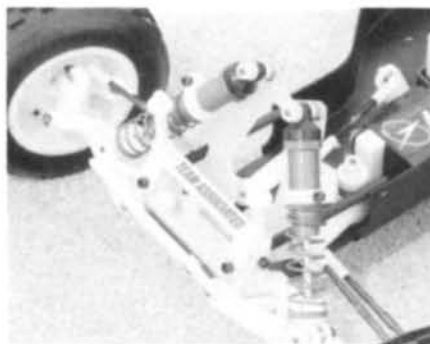
CLOSE SCRUTINY

The new, lightweight, suspension arms have a triangular "bridgework" design for strength and durability. The wheelbase has been extended through the nose plate. Long wheelbases tend to reduce steering capabilities, so Associated increased the steering by adding more shock progression, i.e., the angle at which the shocks are mounted.

(Continued on page 126)



Wide-track rear arms minimize tire scrub and, to keep oversteer in check, the hub carriers and the inner arm mounts provide 4½ degrees of toe-in.



Long front shocks provide the proper amount of damping for the truck's unique suspension geometry. Of course, the 10T uses Associated's hard-anodized Team shocks.

TRUCK OF THE YEAR

IT'S HARD to believe that Associated's RC10T exploded onto the market just one year ago. The truck was an instant success, and after-market parts manufacturers soon began to offer products that were designed to complement it. We decided to list a few of the most popular RC10T after-market parts as part of our "Truck of the Year" extravaganza. OK RC10T owners, here are the goods! Now you only have to decide which goods will be good for your truck.



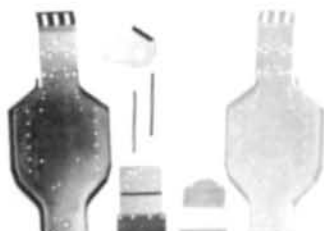
RC10T BU



A&L Chassis Stiffener/ Battery Mount

Designed for the RC10 and RC10T tub chassis, A&L's new stiffener is also a quick-release battery-mounting system. It greatly strengthens the chassis by preventing bending and tweaking, and it holds the batteries in place securely.

Part no. 2200
Price: \$16.75



ASSOCIATED ELECTRICS Neon-Colored Chassis and Nose Plates

These chassis and nose plates are available in a variety of neon colors: hot pink, red, blue, green and yellow. Also available are black-anodized chassis parts, including chassis (6301); nose plates (6309); nose-brace tubes (6321); and motor-mounting plates (6604).

Part nos. 6302 to 6307 (colored chassis); 6315 to 6319 (colored nose plates).
Prices: \$35; \$11.



DAHM'S RACING BODIES '91 Thriller ST

Made of .030-inch-thick GE Lexan, the light—yet strong—Thriller ST Nissan Pathfinder body features aerodynamic styling, a narrow racing profile, a sunroof, a hood scoop, wide wheel flares, and many other details. It comes with Dahm's decals and finishing/mounting instructions.

Part no. D191ST
Price: \$19.98



DURATRAX RC10T Molded-Graphite Shock Towers

Team DuraTrax offers molded-graphite shock towers for the front and rear of your RC10T. These durable, light, drop-in replacements for the stock fiberglass towers were specially designed for truck racing. Rigid, molded-graphite-composite construction makes them strong and helps to reduce flex.

Part no. DTXC2512
Price: \$19.95



HPI Wide Tread Hub

Wide Tread RC10T and Kyosho truck hubs are designed for use with HPI's Super Star monster-truck wheels. The RC10T hubs increase the truck's track by 1.18 inches (0.59 inch on each side); the Kyosho hubs increase it by 1.1 inches (0.55 inch on each side).

Part nos. 6165 (RC10T); 6170 (Kyosho trucks).



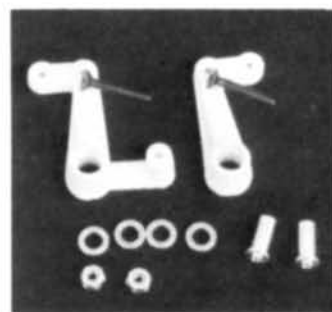
MIP Hard-Coated Shock Bodies

Get shocked with MIP's new line of Teflon-coated, hard-anodized shock bodies! Not only do they improve handling and provide excellent damping,

but they also resist wear from both the piston and the spring. All sizes are for Associated cars.

Part nos. AS-1 (1.320 stroke); AS-2 (1.020 stroke); AS-3 (.710 stroke); AS-4 (.560 stroke); AS-10L (.560 stroke); AS-18 (1.560 stroke); AS-40 (1.320 & .710 stroke).

Prices: \$16.25/pair; \$16/pair; \$15.50/pair; \$15.25/pair; \$7.50 each; \$24.95/two pair; \$24.95 pair of each.



MIP Ball-Bearing Steering Kit

Made of glass-filled nylon, MIP's ultra-light, ball-bearing steering system is strong, smooth and durable, and it comes with Teflon-sealed ball-bearings. These direct stock replacements will eliminate side play and bump-steer.

Part nos. AS-50 (RC10); AS-100 (RC10T).

Prices: \$19.95; \$21.95.



PSE RC10T Tranny Brace

Replace your RC10T tranny brace with PSE's adjustable transmission/shock tower brace. It's designed to reduce flexing of the shock tower and offer stability to the transmission to increase traction.

Part no. 96050
Price \$3.50

Y E R S ' G U I D E

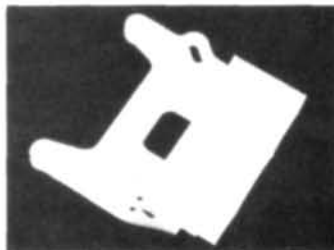
**RPM****RC10 93-Tooth Gear Cover**

This tough, rigid cover is injection-molded of black nylon and is designed to cover even the largest spur gears used on truck conversions (up to 93-tooth, 48-pitch). It isn't affected by motor sprays, oil, or grease, and it can clear an MIP or A&L slipper. It has a 3/4-inch-diameter access hole for easy diff adjustments, and it comes with two 4-40x5/8-inch cover screws. For safety reasons, all gears should be covered.

Part no. 7008
Price: \$5.95

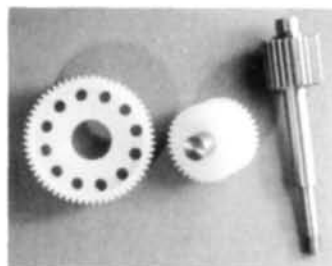
easily. The injection-molded posts have slightly pointed ends to help you insert them in the body holes easily. The set includes two fronts and two rears.

Part no. 7014
Price: \$2.50

**RPM****RC10T Rear Bulkhead**

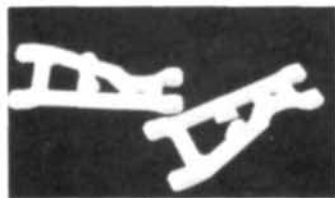
This is a great improvement for your RC10T. To prevent the shock tower from flexing, the holes for two of the screws that are used to secure it have been moved up and outward. RPM has removed the "ears" for the camber rods, molded in the new "inside" stock holes and added another hole. The mounting position for the Stealth tranny brace has been moved up so that it's at the same height as the tranny. The bulkhead is injection molded of white nylon that can be dyed, and it has a wire harness for the wires that go to your motor.

Part no. 7038
Price: \$7.95

**THORP MFG.****64-Pitch Stealth Gear Set**

These machined, 64-pitch gears for your RC10 Stealth gearbox have a new, lower, 2.3:1 gear ratio. They can make your transmission run more smoothly and improve your car's performance.

Part no. 4760
Price: \$32

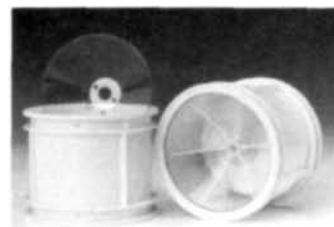
**RPM****RC10T Arms**

These RC10T rear arms are direct replacements for Associated stock arms. The shock-mounting positions are slightly higher to allow more downward travel and to prevent the dogbones from binding. The RC10T front arms are .030 inch longer on each side than the stock arms. Both sets are made of tough nylon that can be dyed, and are designed so that sand and pebbles won't get caught in their ribs. They fit snugly and move freely on the hinge pins.

Part nos. 7030 (rear); 7040 (front).
Price: \$11.95/pair

**RPM****RC10T Body Post Set**

This heavy-duty body post set is made of a hard grade of nylon (it can be dyed), so its 4-40 screw threads won't be stripped



TEAM LOSI
One-Piece RC10T
"Disk" Wheels

Team Losi's new, ultra-light, one-piece RC10T wheels are similar to those used on the LX-T. Their clear exterior caps keep dirt out and can be painted to give the wheels a custom look. The wheels are available in natural (white) and neon yellow.

Part nos. A-7071 (front/natural); A-7174 (front/neon yellow); A-7181 (rear/natural); A-7184 (rear/neon yellow); A-7198 (set of four replacement caps).

Prices: \$7 (wheels); \$4 (caps).



TRINITY PRODUCTS
Stealth Gear

This gear is designed to fit the RC10T (especially with the Stealth tranny). Made of a durable composite material, the gear has a computer-designed tooth shape that will reduce parasitic drag and increase speed run times. The 48- and 64-pitch gears are available in 78- to 125-tooth sizes.

Part nos. MM700 to MM795.
Price: \$3.99

MANUFACTURERS INDEX**A&L Mfg.**

P.O. Box 2115
Corona, CA 91718
(714) 735-5249

Associated Electrics

3585 Cadillac Ave.
Costa Mesa, CA 92626
(714) 850-9342

Dahm's Racing Bodies

P.O. Box 360
Cotati, CA 94931
(707) 792-1316

DuraTrax/Great Planes

Model Distributors
1608 Interstate Dr.
Champaign, IL 61821
(217) 398-3630

HPI (Hobby Products International)

22600-C Lambert St., Ste. 904
El Toro, CA 92630
(714) 837-3250

MIP (Moore's Ideal Products)

746 E. Edna Pl.
Covina, CA 91723
(818) 339-9007

Parma International Inc.

13927 Progress Pky.
N. Royalton, OH 44133
(216) 237-8560

RPM

14978 Sierra Bonita Ln.
Chino, CA 91710
(714) 393-0366

Team Losi

13848 Magnolia Ave.
Chino, CA 91710
(714) 465-9728

Thorp Mfg.

4054 E. Mission Blvd.
Pomona, CA 91766
(714) 622-6518

Trinity Products

1901 E. Linden Ave., #8
Linden, NJ 07036
(908) 862-1705

TRUCK OF THE YEAR RC10T

R / C R A C E R

Manufacturer Associated
Electrics
Type Racing truck
Scale 1/10
Price \$335

DIMENSIONS:
Overall length 15.75 inches
Width 12.625 inches
Wheelbase 11.375 inches
Front track 12.25 inches
Rear track 12.625 inches

WEIGHT:
Gross (with battery) 3 pounds, 9.5 ounces

BODY:
Type Associated racing truck
Material Polycarbonate

CHASSIS:
Type Tub
Material Aluminum

DRIVE TRAIN:
Primary Gear
Transmission Stealth gear
Differential(s) Ball
Bearings/Bushings Bearings

SUSPENSION:
Type (f/r) Lower A-arm/upper link
Damping (f/r) Oil-filled, coil-over shocks

WHEELS:
Type (f/r) 3-piece nylon
Dimensions (DxW) (f/r) 1.75x2.2 inches

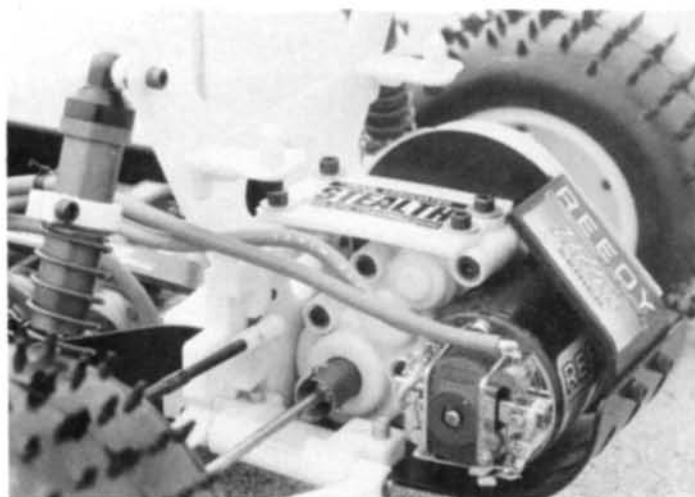
TIRES:
Front Associated block ribbed
Rear Associated spikes

ELECTRICS:
Motor Not included
Battery Not included
Speed controller Not included

OPTIONS AS TESTED:
Tekin* 410K ESC and FM receiver; Reedy* Mr. S motor; Airtronics* Caliber radio and 152 servo; 6-cell 1400mAh SCE battery pack; Associated Blue springs.

COMMENTS:
Out of the box, this stadium truck is hot! Just experiment with the shock oil and the tire combinations and adjust the springs, and you'll have a flat-out competitor that's capable of wins at any level!

Part of the RC10T's success can be attributed to its smooth-operating Stealth tranny. With a low rotating mass and an externally adjustable slipper clutch, the Stealth performs flawlessly.



The new steering mechanism helps to eliminate bump-steer, and it has a built-in servo-saver with an adjustable spring. You can have as much or as little "saving" as you need. (Some of us will need more than others!)

The rear suspension mount has 3 degrees of anti-squat and 1.5 degrees of toe-in built in. The rear hub carriers have 3 degrees of toe-in built in for a grand total of 4.5 degrees of toe-in on each side. The increase in toe-in helps to stabilize the truck on the straights and entering the turns.

Shocks with hard-anodized and/or

Teflon coatings seem to be the wave of the future. The RC10T's low-maintenance, durable shocks operate smoothly and, using Associated's new line of rated springs (their rating is denoted by their color), you'll be able to fine-tune the suspension to any track around. And I do mean *any* track! You can race the RC10T on carpet, dirt and asphalt in—take a guess—that's right...asphalt-oval stadium-truck racing! Next, you'll see superspeedway—10T style!

(Continued on page 152)

"THREE GUYS" DESIGN TEAM



The level of sophistication in R/C has risen well above the seat-of-the-pants days when the credo was, "Think it, build it, try it!" Today's successful racing teams are backed by a lot of engineering expertise.

The design team of Roger Curtis, Curtis Husting and Cliff Lett works like a quartz clock on West Coast time. Although Roger seems to be the engineering genius, all three men participate in the development process. Curtis shines when it comes to machining, and he's a wizard at making the team's ideas into realities. Cliff does a lot of the designing, making good use of his CAD knowledge. His forte lies in testing and evaluating, and he carefully checks out everything—right down to the smallest part.

Have you ever wondered why it takes Associated so long to release new parts or kits even though you've been hearing about them for months? The answer is simple: "Take your time, and do it right!" is the motto that these guys live by. Some parts take weeks, months, or even years to reach the market. This philosophy was used for the Stealth tranny, the Team Car and the RC10T, and it's probably why the RC10T was good enough to be chosen the Truck of the Year!

SPEED SHOP



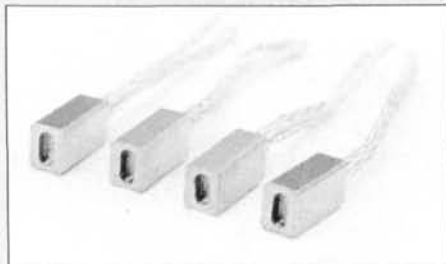
ROYAL PRODUCTS

• Expanded-Scale Voltmeter

Royal's new expanded-scale, easy-to-read voltmeter can be used to accurately test 9.6V transmitter packs and 4.8V receiver packs. This easy-to-grip unit has a built-in load to simulate the working conditions of your receiver pack; a color-coded safety scale; and a load feature that lets you time the discharge rate, which can help you determine how long your radio batteries will last. A banana plug and a wiring harness are also available.

Price: \$12.95

Royal Products Co., P.O. Box 5026, Denver, CO 80217.



TRINITY

• Cavity Brushes

Each of Trinity's new brushes has a cavity in its face, and this reduces commutator drag and increases the horsepower and the contact pressure between the brush and the comm. For modified motors, try the hard, copper brushes; for stock motors, try those made of silver and copper. Both types of brush have dual silver shunts (to reduce the resistance of the leads) and eyelet terminals that allow neat, easy, screw-in installation.

Part nos. 4490 (copper); 4491 (silver and copper). Trinity Products Inc., 1901 E. Linden Ave. #8, Linden, NJ 07036.



PARMA

• Universal Wing Mounts and Buttons

Parma's new anodized-aluminum wing mounts and buttons accommodate heavy-duty .080-inch wire, so using them will enable you to increase the wing's rigidity and transfer more power to the road. They have a hex-shaped base for easy installation, and they come with all the necessary hardware.

Part nos. 10401 (universal wing mounts); 18641 (wire buttons).

Price: \$4.95 each

Parma International Inc., 13927 Progress Pky., N. Royalton, OH 44133.

A&L

• Concept Body for Pro SE

Designed for the Losi Pro SE, the tight-fitting Concept body will help to keep dirt out of the chassis. Its molded side dams keep the rear shocks clean, and you can open its molded air scoops to keep the speed controller and the motor cool. It comes with an A&L wing.

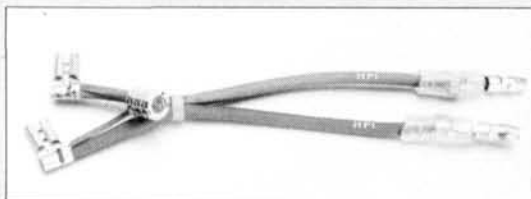
Part nos. 9507 (body and wing); 1035 (wing only).

Prices: \$12.95; \$2.95.

A&L Mfg., P.O. Box 2115, Corona, CA 91718.



Descriptions of the products shown on these pages were derived from press releases supplied by manufacturers and/or their advertising agencies. The information given is neither an endorsement of the product by *Radio Control Car Action*, nor a guarantee of performance or safety. If you write to the manufacturer about any product described here, be sure to say that you read about it in *Radio Control Car Action*.



HPI

• Motor Connectors

Why solder the wires to your motor or mechanical speed controller when you can just push them into place? HPI's easy-to-install motor connectors are perfect for Tamiya or Kyosho car owners who want to use HPI's UNO motors.

Part no. 1770

Price: \$2.50

Hobby Products International, 22600-C Lambert St., Ste. 904, El Toro, CA 92630.



CUSTOM WORKS

• Qualifier Tires

Custom Works' Qualifier tires are made of a softer compound than the company's Sticker tires. They work well on tracks that are slightly too "loose" for foam tires. Although they were designed with Intimidator and Enforcer rims in mind, Qualifiers will fit other 2-inch-diameter rims, i.e., 1-inch-wide fronts and standard-width rears.

Part nos. 6203 (fronts); 6213 (rears).

Prices: \$11; \$12.

Custom Works, 3720 Easton Dr. # 7, Bakersfield, CA 93309.

HPI

• Motor-Cooling Plate

HPI's machined-aluminum motor-cooling plate fits between the motor and the mounting plate. Its "finned" design lets cooling air circulate through the motor, yet it keeps dirt out of the gear case. An included foam seal ensures that dirt



THORP

• Thrust-Washer Kit

Thorp's washer kit is designed to replace the slipper-clutch thrust washer on the Associated Stealth tranny. It provides twice the contact area of the stock version, so it increases the efficiency of the slipper and enables it to operate more smoothly.

Part no. 4766

Price: \$5

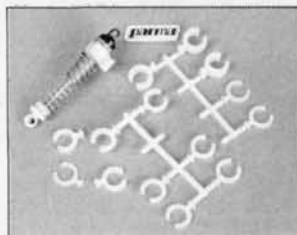
Thorp Mfg., 4054 E. Mission Blvd., Pomona, CA 91766.



PSE

• Snap-On Shock Collars

It's easy to tune your off-road car with PSE's quick-change, snap-on shock collars for Associated shocks. Made of durable, light-weight, injection-molded



nylon, they come in sets with four sizes.

Part no. 96150

Price: \$ 4.95

Parma International Inc., 13927 Progress Pky., N. Royalton, OH 44133.

WIHA

• Bit Selector

This tool includes 10 bits and a magnetic adapter/extender that allows you to use it with power tools. A sliding drawer in the convenient storage box provides quick access to the bits and the adapter. The bit assortment for the 1/4-inch hex includes four slotted ($3/16$, $7/32$, $1/4$, $5/16$), three Phillips (1, 2, 3) and three Torx (T10, T15, T20).

Part no 79243

Price: \$19.95

Bondhus Co., 1400 E. Broadway, Monticello, MN 55362.



won't pass between the motor and the plate and foul the gears.

Part no. 6095

Price: \$12

Hobby Products International, 22600-C Lambert St., Ste. 904, El Toro, CA 92630.

BUILD YOUR OWN PIT STOP RADIO

To transfer the pattern onto the board, you need a Radio Shack direct-etch dry-transfer kit. It contains four sheets of rub-

The holes for the timer IC and the 6V AN7806 voltage regulator must be determined with the use of an accurate .1-inch grid; use the appropriate pattern on the dry-transfer sheet. For the IC holes, transfer two rows of seven pads onto the copper board; for the regulator, transfer one row of three pads. The two largest pads must line up with the on/off-switch lugs on the back of the pot. Use the switch as a guide to establish the position of these two holes.

*Fine-tuning
while
your
transmitter
is impounded*



SCHEMATIC PIT STOP RADIO

PIT STOP RADIO

For the rest of the parts, spacing isn't critical.

Double-check your layout to ensure that the transfers are positioned correctly. Follow the instructions for etching in the Radio Shack pc-board kit. Don't spill the etching solution; it's quite strong, so it will stain or damage anything that it touches.

Next, drill the holes in the board. Use a 1 1/64-inch drill bit for the two holes marked "A" and a 1/16-inch bit for the three holes marked "B." Drill the unmarked holes with a .040-inch, no. 60 bit.

INSTALLING PARTS

The assembly drawing (Figure 3) shows the location of the parts as viewed from the component side. Be careful not to install the timer IC, the voltage regulator, the 1N4001 diode, or the 33-microfarad capacitor backwards. They're polarized and will work *only* if they're installed properly.

The timer IC either has a notch in its pin-1 end or a dot next to pin 1. The voltage regulator has a metal heat sink on one side. Position the heat sink as shown in Figure 3. The diode has a band or stripe on one end, and the position of this band is shown in Figure 3. Either the positive (+) or the negative (-) end of the 33-microfarad capacitor will be labeled. Figure 3 shows the position of the positive end.

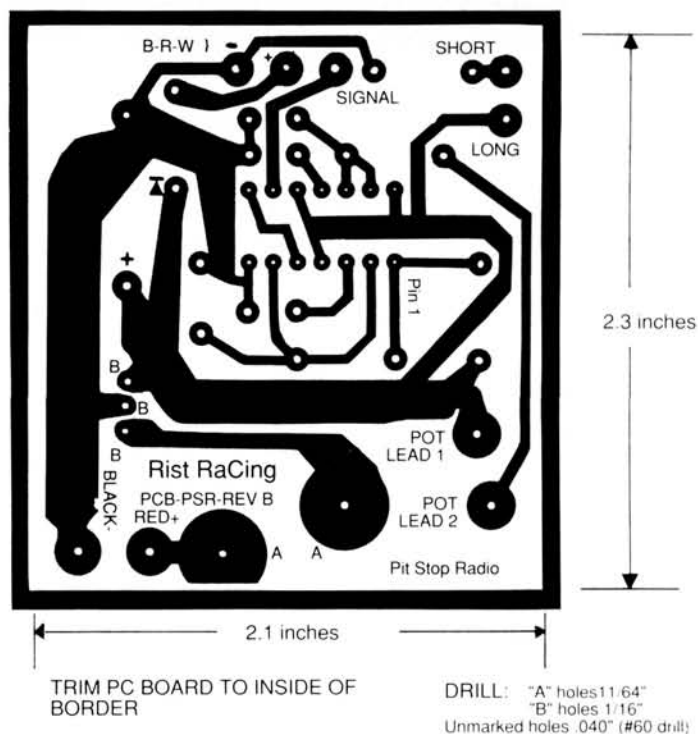
After you've mounted and soldered these four parts, mount and solder the rest, including the 9V-battery snap connector. The orientation of the red and black wires is shown in Figure 3. Check that you've positioned all the parts correctly and that you haven't created solder bridges between any of the adjacent pins.

DRILLING/LABELING THE CONTROL PANEL

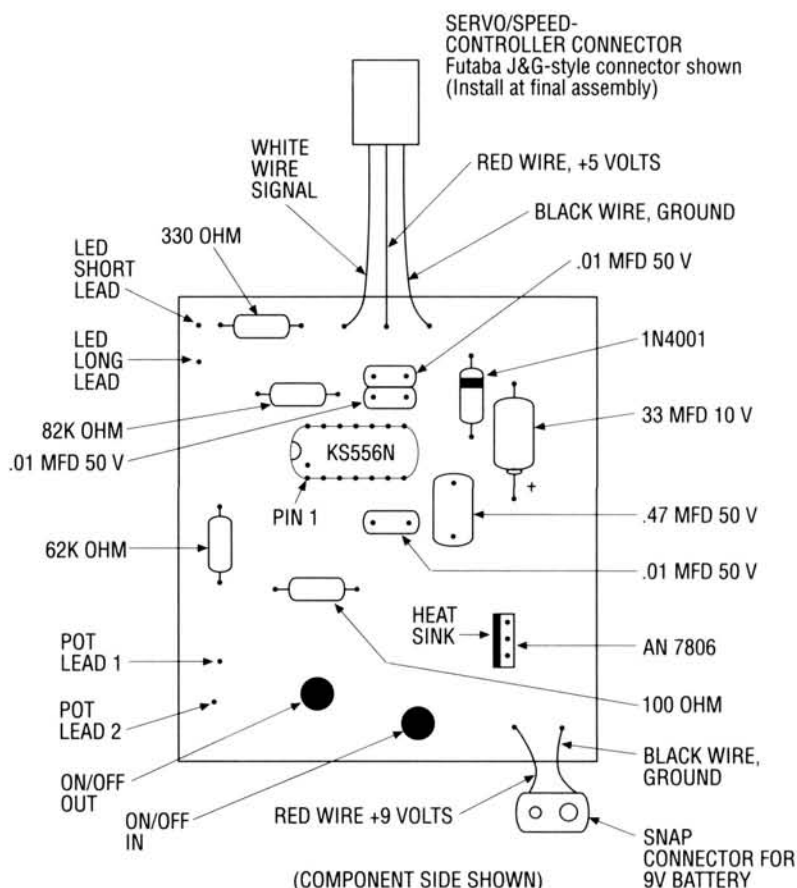
Using the hole pattern shown in Figure 4, drill the holes in the aluminum panel that comes with the Radio Shack project box. You don't have to decorate the front panel, but it does improve its appearance. You can make decals using Avery 5x3-inch adhesive-backed labels and press-type lettering, both of which are available at art and business supply stores.

For the best results:

- drill the panel as shown in Figure 4;
- wash it, and put the label on it;
- trim the label's border and, using the aluminum panel as a pattern, cut holes in it with an X-Acto knife;



ARTWORK
FIGURE 2



ASSEMBLY
FIGURE 3

PIT STOP RADIO PARTS LIST

RADIO SHACK PARTS

Quantity	Part No.	Description	Price
1	270-233	project box	\$2.29
1	271-1722	100k-ohm pot	\$1.19
1	271-1740	SPST pot switch	\$0.79
1	274-402	control knob	\$1.19 pkg. of 2
1	270-325	9V snap connector	\$1.19 pkg. of 5
1	276-1576	pc-board kit	\$9.95
1	276-1577	direct-etch transfers	\$2.99

(Pick one of the following Ace R/C connectors to match your receiver connector type.)

Quantity	Part No.	Description	Price
1	19K83	Futaba J Rx cable	\$3.00
1	19K42	Futaba G Rx cable	\$3.50
1	50L705	no. 0 grommets	\$1.49 pkg. of 20
1	37K62	foam rubber (1/4x6x6")	\$1.00

DIGI-KEY PARTS

Quantity	Part No.	Description	Price
1	P374	T-1 1/4 red LED	\$1.80 pkg. of 10
1	NSC004	LED mounting clip	\$0.60 pkg. of 10
1	1N4001	1A, 50V diode	\$0.60 pkg. of 10
1	KS556N	556 dual-timer IC	\$0.70
1	AN7806	6V, 1A regulator	\$0.75
1	100Q	100-ohm 1/4W 5%	\$0.26 pkg. of 5
1	330Q	330-ohm 1/4W 5%	\$0.26 pkg. of 5
1	82KQ	82k-ohm 1/4W 5%	\$0.26 pkg. of 5
1	62KQ	62k-ohm 1/4W 5%	\$0.26 pkg. of 5
1	P5014	33µF* 10V cap	\$0.24
1	P4533	0.47µF 50V cap. 5%	\$0.39
3	P4513	0.01µF 50V cap. 5%	\$0.14 (\$0.42)

Rist RaCing

As an alternative to the "etch-your-own" pc board from Radio Shack, Rist RaCing offers a ready-made version (no. PCB-PSR-B) and a front-panel decal for \$6.

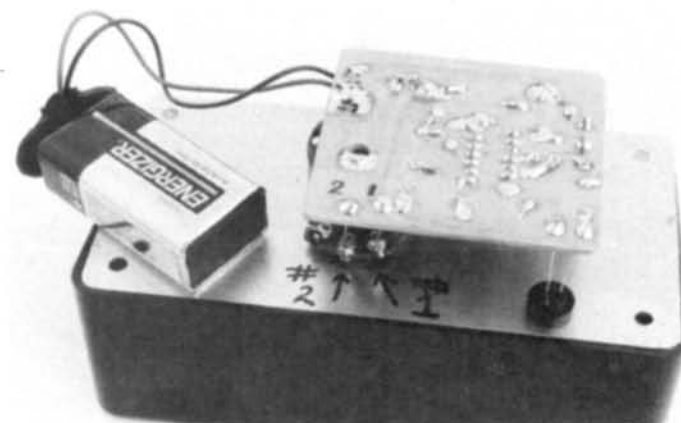
*µF = microfarad

- apply the press-type lettering;
- cover the decal with transparent tape to protect it.

Next, mount the front panel parts. Put the on/off switch on the back of the 100k-ohm pot. Cut the pot's shaft so that it's 1/2 inch long, and then bolt the pot-switch assembly onto the panel. Install the knob on the pot shaft, and mount the LED using the appropriate mounting clip. Install the connector-cable assembly in its hole using a no. 0 grommet. For a connector cable, you can also use a servo-extender cable (sometimes called an aileron-extender cable) that matches your radio system.

FINAL ASSEMBLY

Refer to the picture of the finished pc board. (It has been mounted on the back of the finished front panel.) The board is sup-



The finished pc board is mounted on the rear of the front panel. A 9V battery is used for power.

ported by the two on/off-switch lugs. Bend them and solder them to the etching that surrounds the two large holes. Feed the LED's short lead through the hole marked "short," and its long lead through the hole marked "long" (see Figure 2), and solder

both into place. Using two short pieces of bus wire, connect pot lead no. 1 and pot lead no. 2 to the corresponding holes in the board.

Finally, connect the output connector-cable assembly to the pc board. The three pads on the board are labeled "negative," "positive" and "signal." Figure 3 shows the pin arrangement for the Futaba* J and G connectors. If you use another type of connector, be sure to connect its ground lead to negative, its +5V lead to positive and its signal lead to signal.

Wrap the 9V battery in a 6x6-inch piece of 1/4-inch-thick foam rubber, and install the radio in the box. You should now have a working Pit Stop radio. Turn it on to see if the LED lights up; if it doesn't, check for 6 volts on the positive end of the 33-microfarad capacitor, and check that the LED hasn't been installed backwards. Plug in a steering servo and see if you can control it by turning the knob. If there's no response, check all the connections, parts values and parts polarity. If everything has been positioned properly, the Pit Stop radio will work.

Warning: be careful when you use the Pit Stop to run ESCs that have been connected to high-power motors. They may start to run as soon as you turn on the power, so be sure that nothing is in the way.

HOW TO OPERATE THE PIT STOP

The connector on the Pit Stop radio should match the connectors on your R/C receiver.

The signal that comes from this connector is the same as that coming from your receiver when you operate your transmitter. To test a servo or an ESC, just unplug it from your car's receiver, and plug it into the Pit Stop's connector. Turn on the radio and use the knob on its face to control the servo or ESC.

CALIBRATION

To get the most out of your Pit Stop radio, calibrate it to your transmitter. On the radio dial, make a mark that matches a given setup on your transmitter. Now you can

AUTOSCORE

The ultimate race scoring and race management program

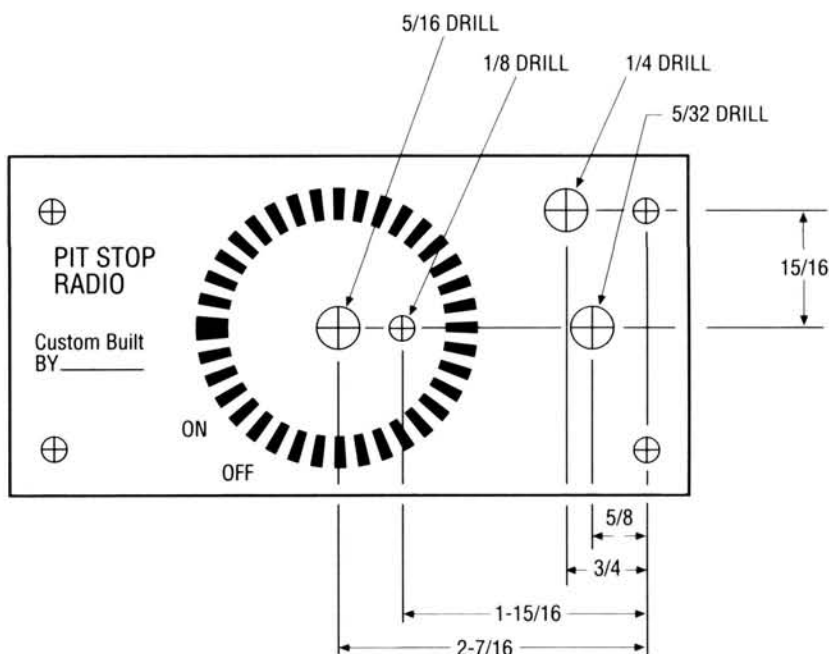
- Menu driver - user friendly
- Quickly resolves frequency and number conflicts
- Sets up heats and mains in minutes
- Scores all qualifiers and mains by racer's name
- Will score up to 10 qualifiers and 1 main for each racer
- Can handle up to 1000 racers in 30 classes
- Prints complete standings by name or position
- Positions, lap times and speeds continuously displayed
- Runs on IBM pc or Compatible
- Only \$250, PRO version \$450
- Can be used with the AMB scoring system
- 1/4 scale version also available

**AUTOSCORE
IS
THE VERY BEST**

You can customize the program to your race format. It has been designed and modified over the years to handle all race conditions. You will not find a better program on the market. Call or write for a FREE demo disk and check it out for yourself.

B & B Software - 2146 Palomar Ave
Ventura, Ca 93001 (805) 643-2042

PIT STOP RADIO



FRONT PANEL DRILL PLAN

FIGURE 4

replace a servo or an ESC knowing that the new one will match the transmitter settings.

Before you calibrate the radio, use your transmitter to make sure that the steering servo and ESC are operating normally. Set the steering trim so that the car runs straight, and note the position of the steering servo output arm that corresponds with this trim setting.

Adjust the ESC's neutral and full-speed trim pots for normal operation. Turn off the transmitter and plug the steering servo into the radio. Turn the knob on the radio until the steering servo's output arm returns to the position that you've established as "running straight." With a fine-tip pen, mark this point on the dial. Plug in the ESC and make two or three marks on the dial: one for neutral (determined by when the motor stops running); one for full on (as indicated by the ESC's full-on LED); and, if you have an ESC with reverse, one for reverse. Using these marks as guides, you can now check that your servos or ESCs operate properly without using your transmitter.

You can buy the resistors, capacitors, IC, voltage regulator and diodes from the Digi-Key Corp.*, which has an excellent catalogue of electronic supplies. The output connector and cable are available from Ace R/C Inc.* (You can also buy output cable at



Use the Pit Stop radio to check your ESC and steering servo. It's small, so it fits easily into your toolbox.

your local hobby store.) You can order finished (etched and drilled) pc boards and front-panel decals for \$6 from Rist RaCing*.

With the Pit Stop radio, you can test your car's functions between races without interfering with the race in progress. You'll definitely use this tool a lot—at the track and at home!

*Here are the addresses of the companies mentioned in this article:

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▼ Brent Gottfried tops off the team Delta car in one of the race's 72 pit stops.



Bill Campbell Memorial

ENDU

THE BILL CAMPBELL Memorial Endurance race has a history of tradition and sportsmanship. The SRS Speedway in Phoenix, AZ, hosted this race before most of its track was converted for off-road racing use. The Albuquerque-based New Mexico Radio Control Race Car Club revived the race in '91 and, although the race was limited to 2WD cars,

the grid was filled in less than a week. This event is held in honor of R/C racing legend Bill Campbell—a founder of Delta Mfg. and a designer of one of the first R/C cars.

Although "true" endurance races are rarely less than 10 hours, the '91 race was only five. This year's event was expanded to six hours, but that didn't intimidate any potential contes-



PHOTO BY JEFF BRONSTEIN

LONG RUN



PRO

by JEFF BRONSTEIN

tants. Each of the 11 three-person teams had to run the same car for the entire race. No backup cars were allowed, so broken or damaged cars had to be repaired. Each driver had to run for at least one hour during the race and fulfill turn-marshal duties as directed by the race officials. The only other objective was to keep the car on the track.

THE CONTENDAHS

This year, the participants and sponsors included some of 1/8-scale racing's best. Top contenders Skinny and the Boys, who were sponsored by Paris Racing, ran the Associated RC-500 equipped with a Paris/Rex engine. BMT and Speedline Racing were also favorites with the 2WD Nova Rossi-powered BMT 892.

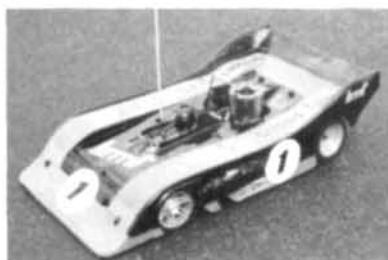
(Continued from page 137)

(Look for a review of this car soon.) Reigning champions Team Delta and David Campbell defend-

Endurance racing is an arduous test of drivers and cars. Speed is always important, but reliability and consistency are vital.

ed their title with the Picco-powered Delta P-2, and Team M&M/Advanced Racing Technology fielded a well-prepared crew. Team Z returned from Lincoln, NE, for yet another shot at the winners' circle. Last year, Team Z built their Delta P-2 in a van on the way to Albuquerque for their very first 1/8-scale event. Local teams rounded out the field of one of the most enjoyable and exciting U.S. endurance races.

Endurance racing is an arduous test of drivers and cars. Speed is always important, but reliability and consistency are also vital. Each team devised a strategy for pit stops, driver changes and the inevitable repairs during the race. Everything but the engine and the chassis could be replaced during the race, and back-up parts were readied. When a car requires work during an enduro race, there's no time for attention to detail!



Here's Team Speedline's 2WD BMT 892. Look for a "Track Report" on this car soon.

AND THEY'RE OFF

Team Skinny and the Boys took the pole position on the back straight. When the flag came down, the cars rocketed off the line as if they were qualifying for a world championship. The first few minutes took a toll on some of the cars, and the faster cars battled to set the pace.

The Team Pushed Pack car popped an engine after only four laps, so the team members were spectators for the rest of the race. Speedline's BMT rapidly moved up to the front from its starting eighth position to give Skinny and the



Boo Scarpati was M&M/Advanced Racing's pit master. Here, he trues some tires for the long main event.

Boys a run for their money. The lead changes in the first 30 minutes were too many to list. I knew that this race would be a battle.

One hour into the race, Skinny and the Boys led with 176 laps—15 laps ahead of the 2nd-place Speedline BMT. Team Z held 3rd by a slim margin over M&M racing. Team Delta, a very competitive team that led the '91 race for more than three hours with David Campbell at the wheel,

ENDURO



Team Speedline captured 2nd place with a very fast, very consistent BMT car (left to right): Tommy Porfino, Mike Queller, Scott "Taco" Barrera.



Team Delta placed 3rd this year (left to right): Jim Rose, David Campbell, Brent Gottfried.

RACE RESULTS

Fin.	Qual.	Team Name	Car	Engine	Body	Tires	Radio	Laps
1	1	Skinny & Boys	RC-500	Paris/Rex	Ellin	Gomme	Futaba	1012
2	8	Speedline	BMT 892	Nova Rossi	VDS	Arrow	Airtronics	986
3	9	Delta	P-2 Delta	Picco	Ellin	Delta	KO Propo	958
4	11	M&M/Advanced	RC-500	Paris/Rex	Ellin	Gomme	Futaba	810
5	5	Team Z	P-2 Delta	Picco P-5	Ellin	Delta	KO Propo	751
6	6	Delta West	P-2 Delta	Nova Rossi	Ellin	Delta	Futaba	685
7	7	Team Nobody	CAM	Nova Rossi	Ellin	Gomme	Airtronics	560
8	4	Over the Hill	CAM	Nova Rossi	VDS	Arrow	Airtronics	536
9	10	Road Warriors	P-2 Delta	Picco P-5	Intrepid	Arrow	Airtronics	337
10	5	Transcendental	CAM/Pres	Paris/Rex	Ellin	Arrow	Futaba	DNF
11	2	Pushed Pack	CAM	Parstein	Nissan	Gomme	Airtronics	DNF

TEAMS AND PARTICIPANTS (pit-crew members are given in parentheses)

Skinny and the Boys: Robert Rones, Sal DiFazio, Brad Morgan (Roger Rones)

Team Pushed Pack: Charlie Rabon, Lock Ely, Tom Welsh

Team Delta West: Bryan Godfrey, Jeff Kilbreth, Brian Regan

Over the Hill Gang: Rich Cunningham, Bob Ewer, Rick Paquin

Transcendental: Davy Preston, Danny Alvarado, Jeff Bronstein

Team Z: Tom Zwieble, Jim Zwieble, Ned Donohoe

Team Nobody: Kenny Noice Sr., Kenny Noice Jr., Ricky Johnson

Team Speedline: Mike Queller, Tommy Porfino, Scott Barrera

Team Delta: David Campbell, Brent Gottfried, Jim Rose

Road Warriors: Mike Ward, Mark Carbajal, Mike Hamilton

M&M Hobbies/Advanced Racing Technology: Mark Miranda, Mike Scarpati, Mark Linder (Boo Scarpati)

NOTES:

Ellin=Associated Ellin
VDS=Parma VDS Loia
Nissan=Parma Nissan
Intrepid=Parma

ENDURO

was 5th. (Last year, David collapsed on the drivers' stand from the intense pressure of the race.)

After three hours of racing, almost every car had made at least one lengthy pit stop for major repairs. Skinny and the Boys led, but a diff problem sidelined their car and the crew had to change the



Racer's Choice distributes this effective new pistol-style pyrometer.

entire rear pod. This gave Speedline, Delta and the rest of the field time to close the gap. Knowing how hard to push a car is part of the strategy involved in endurance racing, and it looked as if Skinny and the Boys might have pushed their car to the limit. Speedline was about to take the lead, but the Skinny crew put its car back on the track in

less than five minutes.

Engine problems sidelined Team M&M/Advanced long enough for Team Delta West to move into 4th. The Over the Hill Gang and the Road Warriors showed remarkable tenacity. They continued to race despite difficulties that ranged from "vanishing" clutch bearings to "spontaneously" bent parts (caused by strange magnetic fields generated by the opposing cars).

At the five-hour mark, Skinny and the Boys had traversed the track more than 825 times, but their

lead had been cut to only 12 laps. Speedline was determined to finish first. When the Skinny car began to have difficulty as its tires wore down the 2nd- and 3rd-place teams thought that they might have one last shot at the winners' circle. A small bump on the back straightaway caused the Skinny car to hop wildly into the air, but the Boys continued

to push it. Speedline came to within eight laps at one point, but body and tire problems derailed the charge. Even this late in the race, the pace was still

and Team Delta finished 3rd with 958 laps. Regardless of its finish, each team had a lot of fun during the six-hour race.

For two years, the Bill



Team Skinny and the Boys used all available hands to change the rear end of the car after a diff problem. It took them less than 5 minutes!

intense. Any major break on the leaders' cars could cause them to fall off the pace and out of the race.

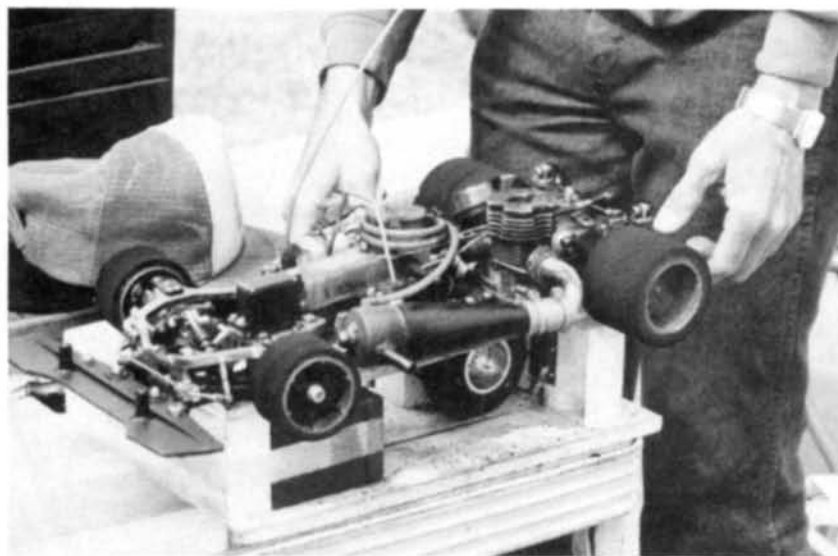
At the end of the six hours, it was clear that Team Skinny and the Boys had really done their homework before the race. They had prepared for every contingency, and their driving was excellent. As the cars crossed the line for the final lap, the spectators and drivers gave the winning team a well-deserved round of applause. Skinny and the Boys had set a difficult pace, and they finished the race with more than 1,000 laps. Their average lap-time—less than 22 seconds—included time for pit stops. Second-place Team Speedline finished only 26 laps back,

Campbell Memorial Endurance Race has been a success in Albuquerque. The New Mexico Radio Control Race Car Club has established a fun-loving approach to racing. This



The winning car was a Paris/Rex-powered RC-500. That's a good combo!

amiable attitude is typical of the growing group of dedicated 1/8-scale racers nationwide. Plans for next year's event include extending the race to seven hours and including a whopping 20 teams—60 drivers! I can't wait! ■



Although it isn't widely distributed, the Cam 2 Cobra (formerly the Jim Cook Cobra III) is still a very reliable chassis.

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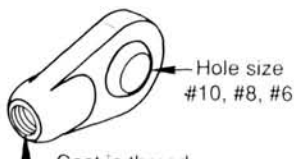


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NITRO NEWS

(Continued from page 100)

ROAR's European counterpart, has already organized a series of races for 1/10-scale gassers.

Q: Can you recommend an engine for a 1/10-scale gas car?

A: To date, the most reliable engine has been the O.S.* .12 CZ-R. This hot little powerplant comes in Kyosho cars and trucks, e.g., the Outlaw Rampage, the ZR-1 and the Nitro Brute, and in Serpent's Impact—a 1/10-scale on-road car. (With this engine and the new tuned-pipe exhaust, the Impact's speed and agility rival that of a 1/8-scale 2WD car.) Schumacher's cars and trucks come with the very potent Irvine .15 engine. Both engines are good but, as 1/10-scale gas grows, we'll definitely see new entries.

Q: Can I race both gas and electric cars?

A: Why not?! There isn't a rule that requires you to sell your electric equipment after you've bought a gas car or truck. Once you start racing gas cars, however, you may find that your batteries will sit on the shelf a lot longer than they used to!

Q: My wife says that if I don't quit racing gas cars then she'll leave me. What should I do?

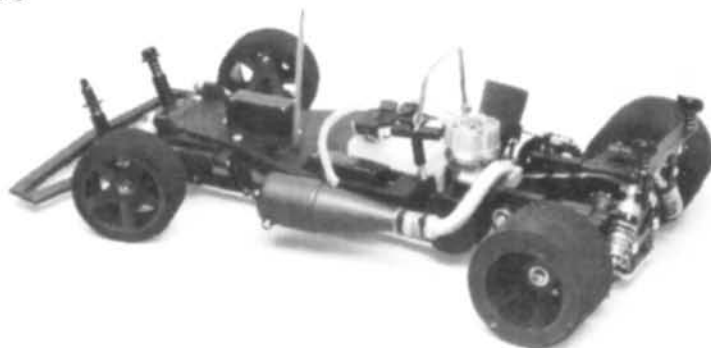
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Niagara Falls, NY 14305

NITRO NEWS

(Continued from page 142)

A: Try not to miss her too much!

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Paris Racing, 4254 Independence St., Chino, CA 91710.

Picco; distributed by Tidewater Engineering, 2406 W. Madison Ave., Bastrop, LA 71220.

Associated Electrics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

Racer's Choice/Arrow Tyres USA, 6N258 Acacia Ln., Medinah, IL 60157.

Serpent; distributed by RC Motor Sports of Miami Inc., 4715 NW 157, Ste. 204, Miami, FL 33014.

Kyosho/Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61824.

Mugen; distributed by Ace Hardware Hobbies, 1863 El Camino Real, Burlingame, CA 94010.

OFNA Racing Division, 18 Technology, Ste. 189, Irvine, CA 92718.

Parma International Inc., 13927 Progress Pky., N. Royalton, OH 44133.

Speedline, 6606 Cypress Pt., N. Austin, TX 78746.

PB Sales & Racing, P.O. Box 51589, New Berlin, WI 53151.

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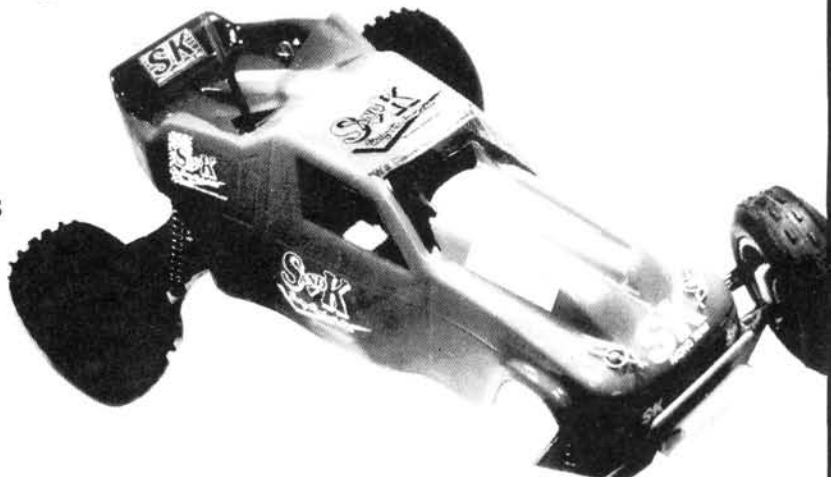
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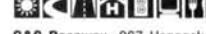


Southtown Hobby & Raceway, 12001 Industry Way #2, Anchorage, AK 99515; Bob or Vickie Peters, (907) 345-3131



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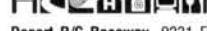
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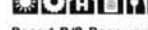
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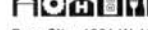
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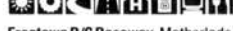
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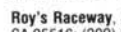
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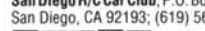
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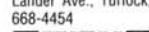
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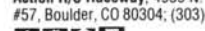
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Edora Park R/C Speedway, Edora Park, Ft. Collins, CO 80524; (303) 482-0197



Hot Lap Hobbies & Raceway, 4206 Wadsworth, Wheat Ridge, CO 80034; Phil Cotter, (303) 420-3051



MHOR R/C Raceway, 15540 E. Batavia Dr., Aurora, CO 80011; Jess Brockman, (303) 343-0151



R/C Mini Sports, 6401 Broadway, Unit G, Denver, CO 80223; Bernie Stolpman, (303) 650-2500



R/C World & Track, 2788 S. Federal Blvd., Denver, CO 80236; (303) 789-0838



Rocky Mountain R/C Raceway, 625 Ford St., Unit B, Colorado Springs, CO 80915; Blaine Schubarth, Randy Joslin, (719) 550-1777



CONNECTICUT

Connecticut R/C Off-Roaders, Old Field School, Mona Terrace, Fairfield, CT 06430; Mike Belmonte (203) 661-0145



East Hartford R/C Speedway, 52 Village St., East Hartford, CT 06108; Bob Matulis, (203) 528-8566



High-Tech Raceway, 374 Enfield St., Enfield, CT 06082; (203) 745-8488



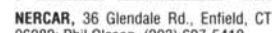
Hobby World Raceways, 161-6 Woodford Ave., Plainville, CT 06062; (203) 793-1111



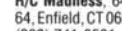
JP's Hobbies & Track, 54 Wakelee St. Ext., Seymour, CT 06483; (800) 547-5772



K/N R/C Speedway Inc., West St., Stafford Springs, CT 06076; (203) 684-9896



NERCAR, 36 Glendale Rd., Enfield, CT 06082; Phil Olsson, (203) 627-5410



R/C Madness, 640 Enfield St., P.O. Box 64, Enfield, CT 06082; Christopher Marcy, (203) 741-6501



KEY TO SYMBOLS

- Indoor
- Outdoor
- Off-road
- Oval
- Dirt oval
- Carpet
- Concrete
- Asphalt
- On-site hobby shop
- AC power
- Automatic lap-counting
- Food available

Track Directory

R/C Raceways Inc., 1265 John Fitch Blvd., South Windsor, CT 06074; (203) 528-3661



R/C World/Sugar Hollow Speedway, 66 Sugar Hollow Rd., Danbury, CT 06810; (203) 748-2185



SCORA/Clayton's Off-Road Racing, 141A Middletown Ave., North Haven, CT 06473; Craig or Keith, (203) 234-CLAY



Tec Tron's R/C Stadium, 52 Village St., E. Hartford, 06108, (203) 289-8119

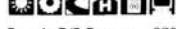


Wallingford Indoor Racing, 63 N. Cherry St., Wallingford, CT 06492; (203) 265-3939



FLORIDA

B+T R/C Central, 811 Playground Rd., Ft. Walton Beach, FL 32547; (904) 863-2666



Barry's R/C Raceway, 2701 SW College Rd. #603, Ocala, FL 32674; Barry Lees, (904) 237-4400



Bransford R/C Speedway, Rt. 3, Box 240, Bransford, FL 32008; (904) 935-0758



Continental Racing, 5335 N. Military Trail, West Palm Beach, FL 33407; (409) 697-5167



Coral Springs Roadrunners, P.O. Box 9632, Coral Springs, FL 33075; Tom Allison, (305) 721-0344 or Rick Schwartz, (305) 344-1983



5-fifty-5 Raceway, County Rd. 555, Bartow, FL 33830; Chuck Nolke, (813) 324-7406



First Coast International Speedway, P.O. Box 1342, Jacksonville, FL 32201-1342; Bob Thompson, (904) 743-2161



Ft. Lauderdale R/C Speedway, 2201 NW 9th Ave., Mills Pond Park, Ft. Lauderdale, FL 33308; Jack Koons, (305) 424-6617



Greater Orlando Auto Racers, 970 Keller Rd., Altamonte Springs, FL 32714; Dave Mottin, (407) 293-7090



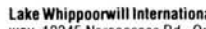
H&H Raceway, 4121 S. Tamiami Tr., Sarasota, FL 34231; (813) 922-7711



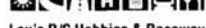
Hialeah Hobby Raceway, 4562 W. 12 Ave., Hialeah, FL 33015; (305) 826-3702



JARCAR Raceway, 7273 103rd St., Jacksonville, FL; Rob Kruse, (904) 272-6315



Lake Whippoorwill International Speedway, 12345 Narcoossee Rd., Orlando, FL 32827; Bob Hosch, (407) 277-9586; fax (904) 759-3993



Lou's R/C Hobbies & Raceway, 1512 SE Village Green Dr., Port St. Lucie, FL 34952; (407) 337-9000



M&M R/C Raceway, 16921 Waterline Rd., Bradenton, FL 34202; Mike Williams, (813) 747-2889



Miami Speedway, 7805 NW 148th St., Miami Lakes, FL 33014; Julio Romero, (305) 687-6728



Ocala R/C Car Club, P.O. Box 70166, Ocala, FL 32670; Larry E. Mitchell, (904) 245-2609; Steve Shook, (904) 694-5147



Ocean Side Raceway, 206 E. Eau Gallie Blvd., Indian Harbour Beach, FL 32937; Michael Kelly, (407) 779-0312



Palm Beach Electric Off-Road Racers, Willows Park, Royal Palm Beach, FL 33406; Mark (407) 790-6917; Walt, (407) 965-2790



PBG R/C Motorpark, 4399 Lilac St., Palm Beach Gardens, FL 33410; Doug Gleason, (407) 624-9252



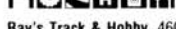
Pro Hobbies Speedway, 715 N. Lake Pleasant Rd., Apopka, FL 32712; (407) 886-4615



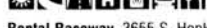
R/C Action, 646 Choy Lee Circle, Orlando, FL 32708; (407) 695-6746



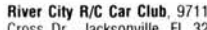
Raceway Hobbies, 1115-J Enterprise Ct., Holly Hill, FL 32117; (904) 258-7537



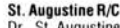
Ray's Track & Hobby, 4605 W. Cayuga St., Tampa, FL 33614; (813) 872-8662



Rental Raceway, 3655 S. Hopkins Ave., Titusville, FL 32780; (407) 383-0631



River City R/C Car Club, 9711 Sharing Cross Dr., Jacksonville, FL 32257; Bill Fraden, (904) 268-1948



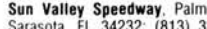
St. Augustine R/C Speedway, 99 Masters Dr., St. Augustine, FL 32095; (904) 824-6357



South Dade R/C Speedway, 25520 SW 141 Ave., Miami, FL 33032; James Bailey, (305) 388-3688



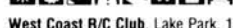
Space Coast Raceway, 563 Barton Blvd., #17, Rockledge, FL 32955; Bill Pinch, (405) 631-4373



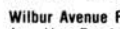
Sun Valley Speedway, Palmer Blvd., Sarasota, FL 34232; (813) 322-1200; (mailing address: Rt. 1, Box 443N, Myakka City, FL 34251)



TJ's R/C Raceway & Hobby Shop, 1010 Creighton Rd., Pensacola, FL 32504; John Jogan, (904) 479-2330



West Coast R/C Club, Lake Park, 17203 N. Dale Marry, Tampa, FL 33549; Tim O'Daffer, days, (813) 969-3683; evenings, (813) 239-9630



Wilbur Avenue Raceway, 1848 Wilbur Ave., Vero Beach, FL 32960; (407) 567-1200



GEORGIA

Carnesville R/C Speedway, Rt. 2, Box 2354, Carnesville, GA 30521; Bobby Maxwell or Byron Sartain, (404) 384-4870 or 384-4587



Case R/C Raceway, P.O. Box 1061, Trenton, GA 30752; (404) 657-6789



Dalton Raceway, 2300 Chattanooga Rd., Dalton, GA 30720; (404) 226-6699



Georgia Hobby Center, 112 Kenwood Rd., Fayetteville, GA 30214; (404) 460-1753



Good Life City Raceway, 6606 Newton Rd., Albany, GA 31707; (912) 888-2515



Lake Mayer Raceway, 1 Melinda, Savannah, GA 31460; Phil Hurd, (912) 355-6033



Middle GA Slot Car, 1805A Watson Blvd., Warner Robins, GA 31088; Larry Tucker, (912) 922-RACE



PDQ Raceway & Hobbies, 341 Senoia Rd., Peachtree City, GA 30269; Richard Burdett, (404) 631-1788



Peach Bowl R/C Speedway, 2035 Westside Ct., Snellville, GA 30278; (404) 985-1448



The Racer's Edge, 1530 Hwy. 19 North, Thomaston, GA 30286; Mark or Roger Walls, (404) 648-6534



Sandy Cross Speedway, Rt. 1, Box 1073, Royston, GA 30662; Morris Phillips or Wayne Fowler, (404) 245-9573



Silver Wings Raceway, 5611 Riverdale Rd., College Park, GA 30349; (404) 991-2225



Sugar Bowl R/C Speedway, 5272 North Ave., Sugar Hill, GA 30518; Shelley or Jan Bailey, (404) 945-6709



HAWAII

Hobby Habit, 70 Kaahumanu Ave., Kahului, Maui, HI 96732; Blaine or Teri, (808) 871-6666



Team PRC Racing Club, Pahoia Government Rd., Pahoia, HI 96778; Charlie Kawamoto, (808) 965-8216



IDAHO

Falls Hobbies & R/C Raceway, 1515 Northgate Mile, Idaho Falls, ID 83401; (208) 529-8650



ILLINOIS

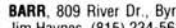
Adam's Blast Track, RR 1, Box 370, Ashmore, IL 61912; John Deffenbaugh, (217) 349-8447



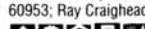
Ameri-Trac, R3, Box 242, Mattoon, IL 61938; (217) 234-8707



Badlands II, 320 W. Jackson St., Vandalia, IL 62471; (618) 283-2913



BARR, 809 River Dr., Byron, IL 61010; Jim Haynes, (815) 234-5615



C&R Hobbies, 39 E. Jones, Mifflord, IL 60953; Ray Craighead, (815) 889-4073



Centennial Park/LeMont Dirt Burners, 7827 Rohrer Dr., Downers Grove, IL 60516; Scott Moravik, (708) 968-6411



Central Illinois R/C Car Club, contact Ron Buhl, 109 Oliver N., Pekin IL 61554; (309) 382-2591 or Randy House, 510 S. 10th, Pekin, IL 61554; (309) 347-4912



Central R/C Raceway, RR 2, Box 51-A, Carlisle, IL 62626; Tim Stewart, (217) 854-9718 or Don Rice, (217) 854-3785



Diehard R/C Raceway, 300 N. Main, Kewanee, IL 61443; Dick Jennings, (309) 852-3700



Eagle Speedway, 303 N. Plum, Pontiac, IL 61764; Joe or Vickie Bachman, (815) 842-1738



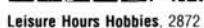
Hobby Town Raceway, 4611 W. Rt. 120, McHenry, IL 60050; Mike Hollingsworth, (815) 344-1777



JC Hobbies/Metro Motor Speedway, Metropolitan Airport, Metropolis, IL 62960; (618) 524-9979



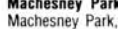
JMP Raceway, 952 Harrison Ave., Wood River, IL 62095; (618) 258-0297 or -0282



Leisure Hours Hobbies, 2872 Plainfield Rd., Joliet, IL 60435; (815) 439-1477



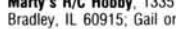
Lisle Community Park Raceway, 1825 Short St., Lisle, IL 60532; Jim Bernicky, (708) 416-6944



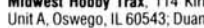
Machesney Park, 1220 Shappert Dr., Machesney Park, IL 61111; (815) 282-1311



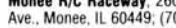
Magnum R/C Speedway, RR #2, Box 399, Danville, IL 61832; Terry & Nancy Dines, (217) 446-2472



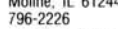
Marty's R/C Hobby, 1335 E. Broadway, Bradley, IL 60915; Gail or Marty, (815) 933-8441



Midwest Hobby Trax, 114 Kirkland Cr., Unit A, Oswego, IL 60543; Duane Pierson or John Koonce, (708) 978-RACE



Monee R/C Raceway, 26049 Ridgeland Ave., Monee, IL 60449; (708) 534-2422



Precision Speedway, 3919 17 St., East Moline, IL 61244; Dan Kennedy, (309) 796-2226



R/C Speed Zone, 1400 E. Lafayette, Bloomington, IL 61701; (309) 662-RACE



The R/C Track, 15022 S. Artesian, Harvey, IL 60426; Edmund Johnson, (708) 331-4079



Radio Active Raceways, 751 N. Bolingbrook Dr., #15, Bolingbrook, IL 60440; Jim or Lenny, (708) 759-7557



Redline Raceway, 921 Harding, Calumet City, IL 60409; (708) 862-8181



Rick's R/C Raceway, 122 W. 12th St., Streator, IL 61364; Rick Wallace, (815) 673-1870



Riverview Raceway, 2550 W. Addison, Chicago, IL 60618; Michael Cardenas, (312) 583-1902



Rockford Scale Raceway, 6400 N. 2nd St., Loves Park, IL 61111; Sam Stroud, (815) 765-2970



Rockford Scale Raceway, 6900 N. 2nd St., Machesney Park, IL 61111; (815) 765-2970



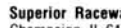
SIRCAR Raceway, 1200 N. Marion, Carbondale, IL 62901; (618) 549-5885



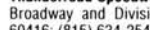
Slot Wing Hobbies Race Place, 1615 W. Springfield, Champaign, IL 61821; (217) 359-1920



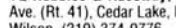
Smithton Community Park, P.O. Box 8152, Belleville, IL 62221; (618) 236-7569



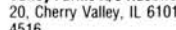
Superior Raceway, 1706 W. Bradley, Champaign, IL 61821; (217) 359-8073



Thunderroad Speedway, Intersection of Broadway and Division, Coal City, IL 60416; (815) 634-2540



TQ Hobbies & Raceway, 13710 Wicker Ave. (Rt. 41), Cedar Lake, IL 60303; Jack Wilson, (219) 374-9776



Valley Farms R/C Raceway, 706 Bypass 20, Cherry Valley, IL 61016; (815) 332-4516



INDIANA

Autograph/Race World, 721 Pendleton Ave., Pendleton, IN 46064; Sam Mudd, (317) 778-3386



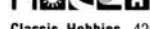
BJ's Riverside Raceway, 265 S. Clay St., Jasper, IN 47546; Joe Lorey, (812) 482-3484



Blaze'n Race'n, P.O. Box 6, Hamlet, IN 46532; James Berndt, (219) 867-1324



Boone County R/C Track, 1300 E. 100 S. Rd., Lebanon, IN 46052; Jerri Moss, (317) 293-2225



CC Hobby & Speedway, RR

The Hobby Prescription, 115 S. Indiana Ave., Auburn, IN 46706; Roxanne Fike, (219) 925-6699



Hobby World Raceway & Hobbies, 1508 N. Harlan, Evansville, IN 47711; Jeff Wassman, (812) 421-1100



K&L Hobbies, 7 Raceway, 2751 N. State Rd. 39, LaPorte, IN 46350; (219) 324-0353



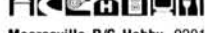
Main Hobbies, 625 Columbia, Lafayette, IN 47901; Randy Palmer, (317) 742-2045



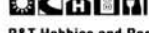
Master Hobbies, 8501 Bash Rd., Indianapolis, IN 46250; Tim or Dan, (317) 576-1961



Mooreville R/C Hobby, 7 Moore St., Mooreville, IN 46158; (317) 831-8877



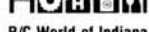
Mooreville R/C Hobby, 9201 S. State Rd. 67, Camby, IN 46113; (317) 831-8877



P&T Hobbies and Raceway, RR 2 (Hwy 60), Mitchell, IN 47446; Paul Weber, Tom Logsdon, (812) 849-6666; fax, (812) 332-0018



R/C Barn, RR 1, Box 17, Monroe, IN 46772; Mark Lengerich, (219) 692-6600



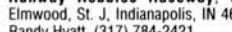
R/C World of Indiana, RR #2, Box 335, Lynn, IN 47355; (317) 874-2464



Raceway Park, 919 E. McKinley, Mishawaka, IN 46545; Bob Bean, (219) 256-1020



Radio Car Craft, 1925 S. Curry Pike, Bloomington, IN 47403; (812) 332-3245



Runway Hobbies Raceway, 5342 Elmwood, St. J., Indianapolis, IN 46203; Randy Hyatt, (317) 784-2421

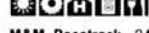


IOWA

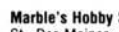
Dubuque R/C Speedway, Dubuque County Fairgrounds, Dubuque, IA 52001; Paul Conlon, (319) 556-2736



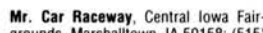
Kodiak Race Track, Box 78, Okoboji, IA 51355; Brad or Dave, (712) 332-7982



M&M Racetrack, 2434 Pilgrim Path, Oskaloosa, IA 52577; (515) 673-6265



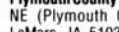
Marble's Hobby Supply, 4685 SE 40th St., Des Moines, IA 50320; Rick Marble, (515) 262-7507



Mr. Car Raceway, Central Iowa Fairgrounds, Marshalltown, IA 50158; (515) 483-2234



North Park R/C Speedway, 805 S. Jerome, Algona, IA 50511; (515) 295-9352



Plymouth County R/C Speedway, 4th Ave. NE (Plymouth County Fairgrounds), LeMars, IA 51031; (712) 546-8788 or 546-9522



Power House Racing, 1200 S. Division St., Creston, IA 50801; (515) 782-4582 or 782-4174



River City R/C Speedway, 317 2nd NW, Mason City, IA 50401; Leonard Johnson, (515) 423-7333



Rotunda Raceway, 101 Bass, RR 1, Box 155A, Storm Lake, IA 50588; (712) 732-4555



Sibley Raceway, Osceola County Fairgrounds, Sibley, IA 51249; Al Reck (712) 754-2604 (day) or 754-3613 (night)



Southwest Iowa R/C Raceway, Kelly Park, Red Oak, IA 51566; (712) 623-5513



Southwest Iowa R/C Raceway, Montgomery County Fairgrounds, Red Oak, IA 51566; (712) 623-5513



Team Johnson Speedway, Jct. Hwy. 34 & 406, West Burlington, IA 52655; (319) 753-0753



KANSAS

ACE Raceway, 325 Commercial, Emporia, KS 66801; Luke Amend, (316) 343-1933



Chad's R/C World & Raceway, 217 Brownie Ave., P.O. Box 76, Scranton, KS 66537; (913) 793-2313



Ebersole R/C Superspeedway, 11417 W. Hwy. 54, Wichita, KS 67209; Len Ebersole, (316) 722-8888



Pittsburg International Mini Speedway, 5111/2 N. Locust, Pittsburg, KS 66762; (316) 232-1973



R/C Superdome & TQ Pro Shop, 14 E. Ave. A, Hutchinson, KS 67501; (316) 665-6633



RCRC Raceway, 507 N. 4th, Atwood, KS 67730; Bob Dunker, (913) 626-3261



Shawnee Hobby & R/C Raceway, 4603 Shawnee Dr., Kansas City, KS 66106; Bill Pugh, (913) 384-3211



KENTUCKY

Bluegrass Int'l/Perry's R/C Hobbies, 214 Globe St., Radcliff, KY 40160; William Perry, (502) 351-3436



East Kentucky Hobby Raceway, Hwy. 15, Garner Mt., Isom, KY 41824; (606) 633-8567



Fast Lane Hobbies & Raceway, 281 Porter Pike, Bowling Green, KY 42101; Greg Bailey, (502) 782-2419



Hobby Center Inc., 2106 Triplett St., Owensboro, KY 42303; Bobby Howell, (502) 683-7611



Hobbys Plus, 819 Main St., Hazard, KY 41701; Joe Mavaro, (606) 436-3175



The Lexington Autodrome Raceway, 2753 Richmond Rd., Lexington, KY 40509; (606) 269-7794



Lexington Model Raceway, 211 New Circle Rd., Lexington, KY 40505; Billy Dent, (606) 293-2751



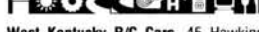
Pro-Trak R/C Racing, 3451 Cane Run Rd., Louisville, KY 40211; Les Wurzel, (502) 239-4307



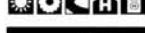
Remote-Control Hobby Shop/Raceways, Rt. 8, Box 211, Mayfield, KY 42066; (502) 247-4715



River Cities Raceworld, 1104 Powell Ln., Flatwoods, KY 41139; (606) 836-CARS



West Kentucky R/C Cars, 45 Hawkins Loop, Symsonia, KY 42082; (502) 851-3534



LOUISIANA

Acadiana R/C Hobbies & Raceway, 120 Toledo Dr., Lafayette, LA 70506; (318) 235-5825



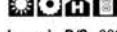
Cajun R/C Raceway, Rt. 2, Box 288 (Hwy. 343, Bosco) Church Point, LA 70525; Ray Thibodeaux, (318) 873-3855



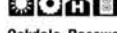
Cajun R/C Raceway, 110 A Darbonne, Sulphur, LA 70663; Sandy Thibodeaux, (318) 527-9129



Johnny V's R/C, 1036 W. Airline Hwy., LaPlace, LA 70068; (504) 651-9045



Loupe's R/C, 888A Madeline Ct., Baton Rouge, LA 70815; Mark Loupe, (504) 927-6275



Oakdale Raceway, 1259 Hwy. 165 S., Oakdale, LA 71463; M.L. Jezorski, (318) 335-3532



Performance Hobby Raceway, 9135 W. Judge Perez Dr., Chalmette, LA 70044; Guy Trentecosta, (504) 271-2468



MAINE

Central Maine R/C Speedway, 18 Lithgow St., Winslow, ME, 04901; David Prescott, (207) 877-2232



Clay Bowl R/C Hobbies, P.O. Box 61, Greene, ME 04236; Pat Cap, (207) 946-5003



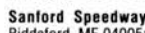
Fun Time R/C Raceway, 508 Riverside St., Portland, ME 04106; Brian Cummings, (207) 878-3129



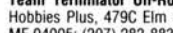
Mementos Hobby Shop, 86 Sweden St., Caribou, ME 04736; (207) 498-3711



Rocket R/C Hobbies, Annabessacook Rd., Winthrop, ME 04364; (207) 377-6910



Sanford Speedway, 479C Elm St., Biddeford, ME 04005; (207) 282-8838



Team Terminator Off-Road Track, c/o Hobbies Plus, 479C Elm St., Biddeford, ME 04005; (207) 282-8838

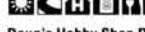


The Racers' Club, 85 Hubbard Rd., Berwick, ME 03901; (207) 698-5337

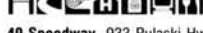


MARYLAND

ABC Raceway, 2825 Ocean Gateway, Cambridge, MD 21613; (301) 228-4291



Doug's Hobby Shop Raceway, Rt. 301N, Box 32B, Waldorf, MD 20601; (301) 843-7774



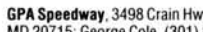
40 Speedway, 933 Pulaski Hwy., Havre de Grace, MD 21078; Doug (410) 538-3135, or Vince, (410) 939-3588



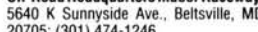
Friendship Off-Road Racers, 1531 Florida Ave., Severn, MD 21144; (301) 551-3050



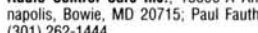
Fruitland Indoor Race Center, 203 N. Fruitland Blvd., Fruitland, MD 21826; Thomas Duncan, (410) 543-4329



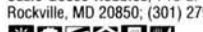
GPA Speedway, 3498 Crain Hwy., Bowie, MD 20715; George Cole, (301) 805-9004



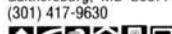
Off-Road Headquarters Indoor Raceway, 5640 K Sunnyside Ave., Beltsville, MD 20705; (301) 474-1246



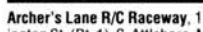
Radio Control Cars Inc., 13600-A Annapolis, Bowie, MD 20715; Paul Fauth, (301) 262-1444



Suzie Goose Hobbies, 718 E. Gude Dr., Rockville, MD 20850; (301) 279-2966

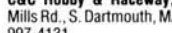


The Track, 16806 Oakmont Ave., Gaithersburg, MD 20877; Mimi Wong, (301) 417-9630

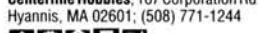


MASSACHUSETTS

Archer's Lane R/C Raceway, 11B Washington St. (Rt. 1), S. Attleboro, MA 02730; (508) 399-6762



C&C Hobby & Raceway, 562 Russells Mills Rd., S. Dartmouth, MA 02748; (508) 997-4131



Centerline Hobbies, 167 Corporation Rd., Hyannis, MA 02601; (508) 771-1244



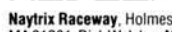
CKS Raceway, 46 Wilbraham St., Palmer, MA 01069; (413) 283-2260



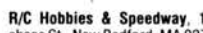
Megadrome Raceway, N. Adams Plaza, Rt. 8, North Adams, MA 01247; (413) 743-7223



Mike's Speedway, Rt. 9, Mt. Farms Mall, Hadley, MA 01035



Nagoy Raceway, 401 Nagoy Park, Acton, MA 01720; Lou Thomas, (508) 264-0087



Track Directory

More R/C Club. 33538 23 Mile Rd., Chesterfield Township, MI 48047; (313) 773-5918 (Tom Kelly) or 749-9774 (Joe)



NMRCC Raceway. 110N. Ostego, Gaylord, MI 49735; Ed Schneider, (517) 732-3963



Pointe R/C. 2119 Summerton Rd., Mt. Pleasant, MI 48858; Frank, (517) 773-5711



R&L Hobbies. 10334 Portage Rd., Portage, MI 49002; (616) 323-3686



R&S Hobbies & Raceway. 230 Mill St., St. Louis, MI 48801; Rich Beard or Scott Davis, (517) 681-3463



RG Enterprises. 600 N. Lafayette, Greenville, MI 48838; (616) 754-4919



Rider's Superspeedway. 42040 Koppernick, Ste. 400, Canton, MI 48187; Brent Martin, (313) 451-5599



Rider's Superspeedway. 4415 S. Westledge, Kalamazoo, MI 49008; Ken Penn (616) 349-2666



T/A Raceway. 119 N. Michigan, Big Rapids, MI 49307; (616) 796-3217



Thumb Raceway. 3441 S. Main St., Marlette, MI 48453; (517) 635-7848



TNT R/C Raceway. 130 W. Washington St., Marquette, MI 49855; Gregory Berg, (906) 228-4098



USA Raceways. 6803 Dixie Hwy., Bridgeport, MI 48722; (517) 777-7USA



Village Hobbies-n-Crafts. 17824 N. Maple Island, Hesperia, MI 49421; Alan or Fran, (616) 854-1374



MINNESOTA

ABC Raceway. 120 2nd St. NW, Pipestone, MN 56164; Ross Lange, (507) 825-5065



C&S Speedway. 312 N. Broadway, Crookston, MN 56716; (218) 281-6665



Greater Minnesota Rac'n' Place. 3302 Southway Dr., St. Cloud, MN 56301; Jon Jackson, (612) 252-9768



Mac's Models. 80 E. Little Canada Rd., Little Canada, MN 55117; Dean Nelson, (612) 482-7796



Minn-E-Golf & Hobby. 9100 Park Ave., Elk River, MN 55330; (612) 441-8365



The PBR Off-Road Rally. 721 Cedar Ave., Hector, MN 55342; Philip Zempel, (812) 848-2129



Range Racing World, Inc. 412 Jones St., Eveleth, MN 55734; Bill, (218) 744-4423



Riverside Raceway. 1830 23rd St. S., Moorhead, MN 56560; Les Sackreiter, (701) 277-0211



Wild West R/C Speedway. 2822 Piedmont Ave., Duluth, MN 55811; Roger Deloach, (218) 727-6248



MISSISSIPPI

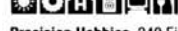
Crossroads Raceway. Mail of Corinth, Rt. 1, Box 1, Corinth, MS 38834; (601) 287-2110



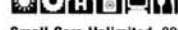
Dixieland R/C Speedway. 2535 Tabernacle Rd., Columbus, MS 39702; Jeffrey Alvey, (601) 326-9429



Norm's R/C Hobbies. 310 E. Beach Blvd., Long Beach, MS 39560; (601) 863-0524



Precision Hobbies. 240 Eisenhower Dr., Biloxi, MS 39531; (601) 388-6346



Small Cars Unlimited. 820 Cooper Rd., Jackson, MS 39212; (601) 372-FAST



Up Front Racing. 649 Norris St., Greenville, MS 38701; Trey Bordonel, (601) 334-9411 or 378-9201



MISSOURI

Doug's Hobbies. 5221 Veil of Tears, Jefferson City, MO 65109; (314) 893-5861



Gateway R/C Track & Hobbies. 255 Marshall Rd., P.O. Box 345, Valley Park, MO 63088; (314) 225-5844



Harrisonville Hobby Shop & Raceway. 2301 S. Commercial, Harrisonville, MO 64701; Richard Taylor, (816) 887-3055



Lafayette Riverside Raceway. P.O. Box 9663, Marshall Rd., Kirkwood, MO 63122; Don Laningham, (314) 966-8912



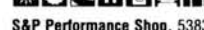
Outback Speedway & Hobby. 2810 Sutton Blvd., Maplewood, MO 63143; (314) 644-3383



Pevely R/C Raceway. 2199 Meadow, Barhart, MO 63012; Jerry Benz, (314) 484-8627



R+ Hobby. 590 Jungemann Rd., St. Peters, MO 63376; (314) 928-9838



S&P Performance Shop. 5383 Highway "N," St. Charles, MO 63304; Paul Lund, (314) 447-5252

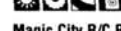


MONTANA

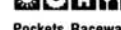
Bozeman R/C Powerhouse Track. west side of the Main Mall, Bozeman, MT 59715; (406) 586-6461



Garden City Raceway. 6725 Hwy. 10 W., Missoula, MT 59802; (406) 721-5405



Magic City R/C Raceway. 14th St. W. & Central Ave., Billings, MT 59101; (406) 259-9004



Pockets Raceway. Montana State Fairgrounds, Great Falls, MT 59405; Greg Vetter, (406) 761-7279



NEBRASKA

HobbyTown USA. 3404 W. 13th St., Grand Island, NE 68801; Ed Conroy, (308) 382-3451



Over the Wall Gang. Higiroadbee Speedway, 401 Market Pl., Norfolk, NE 68701; Matt Moeller, (402) 379-0879



Riverside R/C Raceway. Hwy. 77 S., Fremont, NE 68025; Mike Katz, (402) 721-3952



The Salvation Army. 4032 Harrison St., Omaha, NE 68147-1012; Lt. Michael Delashmit, (402) 634-3414



NEVADA

AMS R/C Raceway. 1130 Icehouse Ave., Sparks, NV 89431; Arnold Wratschko, (702) 355-8803; fax, (702) 825-4052



Little City Hobbies Raceway. 640 Kuenzki, Reno, NV 89503; shop, (702) 786-3611 or Bill Avery, (702) 358-7629



NEW HAMPSHIRE

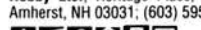
C.T. Hobbies R/C Raceway. 49 Eaton Rd., Auburn, NH 03032; (603) 483-2274



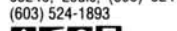
4-K Racing. 100 Warwick Rd., Winchester, NH 03470; (603) 239-6207



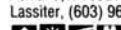
Hobbies Plus R/C Raceway. 14 Celina Ave., Nashua, NH 03063; (603) 882-9200



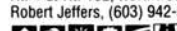
Hobby Etc., Heritage Place, Rt. 101A, Amherst, NH 03031; (603) 955-8549



R&B Racing. Lily Pond Rd., Gifford, NH 03246; Louie, (603) 524-2909 or Bud (603) 524-1893



R/C Racing Connection. P.O. Box 905, Ashland, NH 03217; Mike Bridges or Barry Lassiter, (603) 968-9663



Robert's Railroad & Hobbies. Box 431, Rt. 4 at Rt. 152, Northwood, NH 03261; Robert Jeffers, (603) 942-5193



NEW JERSEY

Action Raceway & Hobby Center. Rt. 295 & Harmony Rd., Gibbstown, NJ 08027; (609) 423-8933



Dave Bicknell Memorial Raceway. P.O. Box 914, Absecon, NJ 08201; Rob Caruso, (609) 748-8291



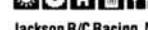
Family Hobbies. Northwst & Weymouth Rd., Vineland, NJ 08360; Ziggy Tepper, (609) 794-8677



Glassboro's Grand Oval Speedway. 167 S. Delsea Dr., Glassboro, NJ 08028; (609) 863-1551



Golden Hobbies & Crafts. 415A Erial Rd., Pine Hill, NJ 08021; (609) 782-1222



Jackson R/C Racing. Marshall Ave., Jackson, NJ 08527; (908) 905-1593



LBRA Track. 392 Warburton Pl., Long Branch, NJ 07740; (908) 222-5122



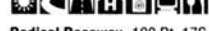
Parlor Hobbies. 34 Broad St., Matawan, NJ 07747; Charlie Roder, (908) 566-3158



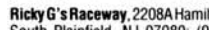
Pixley International Speedway. 763 Peters Dr., P.O. Box 189, Martinsville, NJ 08836; Richard Toole, (908) 560-0399



The Race Place. Rt. 33 & 34, Farmingdale, NJ 07727; (908) 938-5215



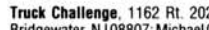
Radical Raceway. 100 Rt. 17S, Lodi, NJ 07727; Lou, (201) 843-6996



Ricky G's Raceway. 2208A Hamilton Blvd., South Plainfield, NJ 07080; (908) 753-1518



Tri-Oval Speedway & R/C Center. 296 S. Main St., Phillipsburg, NJ 08865; (908) 454-2223



Truck Challenge. 1162 Rt. 202-206 N., Bridgewater, NJ 08807; Michael Gill, (908) 658-9616



Zepplin Hobbies. 92 Rt. 23N, Riverdale, NJ 07457; Lou Ballini, (201) 831-7717



NEW MEXICO

Cliff Hanger R/C Raceway I. 1515 E. 20th Space D, Farmington, NM 87401; Butch or Joey, (505) 327-3187



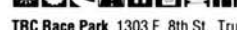
Cliff Hanger R/C Raceway II. 2508 Fox St., Farmington, NM 87401; Butch or Joey, (505) 327-3187



The Pit. Las Cruces Hobby Raceway, 1996-A S. Valley Dr., Las Cruces, NM 88001; (505) 524-8530



Racers Inn. 4300 Rankin Ln. NE, Albuquerque, NM 87107; (505) 345-5988



TRC Race Park. 1303 E. 8th St., Truth or Consequences, NM 87901; Gary Whitehead, (505) 894-3211

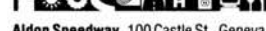


NEW YORK

A&D's FastTracks. 1000 N. Main St., Brewster, NY 10509; (914) 279-2065



A&S Race Center & Hobbies. 120 Cayuga St., Canalview Mall, Fulton, NY 13069; (315) 598-2772



Aldon Speedway. 100 Castle St., Geneva, NY 14456; (315) 789-8343



Belmore Raceway. 2479 Charles Ct., Belmore, NY 11710; (516) 783-3456 or 783-0105



Brookport Speedway. 6000 Sweden Walker Rd., Brookport, NY 14420; Gil & Betty Glidden, (716) 637-6224



Cars R/C & Guitars. 4360 Seneca St., West Seneca, NY 14224; (716) 674-0905



Central New York R/C Auto Racers. Martin St., P.O. Box 116, Rome, NY 13440; John Orr, (315) 336-5140



Chipmuck Hill R/C Speedway. 217 Pine St., Theresa, NY 13961; Ted House, (315) 628-5065



D&J's Speedway. 94 Maple St., Croton-on-Hudson, NY 10520; Dan Spatta, (914) 271-5797



Dirt Track. 17 Fairway Dr., Manorville, NY 11949; Billy Wroblewski, (516) 878-0737



East End Off-Roaders. Route 25A at Gull's Square, Wading River, NY 11792; (516) 929-8844



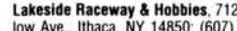
Gamien's R/C Motor Speedway. 8453 Rt. 11, P.O. Box 1430, Cicero, NY 13039; Dave Wright, (315) 699-2991



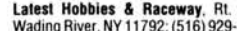
GP Racing. 6785 Martin St., Rome, NY 13440; Greg Philley, (315) 336-5140



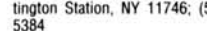
Island Hobbies & Raceway. 410 Commack Rd., Deer Park, NY 11729; (516) 254-6229



Lakeside Raceway & Hobbies. 712 Wil-low Ave., Ithaca, NY 14850; (607) 272-0248



Latest Hobbies & Raceway. Rt. 25A, Wading River, NY 11792; (516) 929-8844



LI 1/4-Scale Racers. 63 Horton Dr., Huntington Station, NY 11746; (516) 351-5384



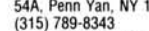
Long Island R/C Club. P.O. Box 539, Miller Place, NY 11764; John Strahm, (516) 821-2797 or John Kiernan, (516) 821-8923



Maspeth Raceway. Rust St. & 57th Rd., Maspeth, NY 11378; (718) 894-0800



Norwood Hobbies Raceway. 2-4 S. Main St., Norwood, NY 13668; Tom Jarvis, (315) 353-6621



Penn Yan Speedway. 98 W. Lake Rd., Rt. 54A, Penn Yan, NY 14527; Seneca

Race O Rama, 44 Sharon Ave., Plattsburgh, NY 12901; James Varno, (518) 562-5442 or 643-2678



Raceworld R/C & Hobby, Budd Rd., Phillipsburg, NY 12769; Joe Colombo Jr., (914) 754-7664



Rapid Transit Raceway, 2104 Broadway, Schenectady, NY 12306; Dick Crounse, (518) 372-0777



Riverside R/C & Hobby, P.O. Box 125, Rt. 126, Beaver Falls, NY 13305; (315) 346-1682



Rochester Raceway & Hobby, 1725 N. Clinton Ave., Rochester, NY 14621; George, (716) 467-2427



Rock River Model Hobbies, RD 2, Box 297, Rock River Rd., Interlaken, NY 14847; Carl Schmidt, (607) 532-9489



Russell's R/C Racetrack, 1793 Ridge Rd., Ontario, NY 14519; (315) 524-2522



Schenectady R/C Speedway, 955 State St., Schenectady, NY 12307; (518) 370-3747



Schoharie Co. R/C Car Club, P.O. Box 126, Cobleskill, NY 12043; (518) 234-4600



Seneca R/C, 2339 Yerkes Rd., Romulus, NY 14541; (315) 789-8343



Skaneateles Raceway & Hobby, P.O. Box 102, Rt. 20, W. Genesee St., Skaneateles, NY 13152; (315) 685-8077



Small Torque Racers of Long Island, 24 Horton Dr., Huntington Station, NY 11746; George Franz, (516) 271-1119



South Shore Hobby & Raceway, 311 W. Roe Blvd., Patchogue, NY 11772; Don Hauck, (516) 658-5567



Team Earthquake, The Hobby House, 114 1/2 Gones & Gifford, Jamestown, NY 14701; (716) 488-1772



Transit Speedway & Hobbies, 5319 Transit Rd., Depew, NY 14043; (716) 684-7368



Walt's Hobby, 2 Dwight Park Dr., Syracuse, NY 13209; (315) 453-2291



Western New York R/C Speedway, 58 Spring St., Cuba, NY 14727; Jason Congdon, (716) 968-3586



Whitestone Off-Road Raceway, 149-50 15th Rd., Whitestone, NY 11357; Whitestone Hobbies, (718) 767-6767



NORTH CAROLINA

C&H Raceway, 1400 N. Cannon Blvd., Kannapolis, NC 28083; Camera & Hobby Shop, (704) 933-5321



Cape Fear Speedway, 207 Harley Rd., Wilmington, NC 28401; Bob Justice, (919) 762-1184



Carolina R/C Drag Assoc., 907-C Warsaw Rd., Clinton, NC 28328; (919) 592-9489



Charlotte R/C Raceway & Hobbies, 5820 Old Concord Rd., Charlotte, NC 28213; (704) 597-0608



Clapp's R/C Motor Speedway, Rt. 4, Box 300A, Siler City, NC 27344; Al Clapp, (919) 663-3198



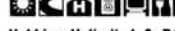
Clinton R/C Raceway, 907-C Warsaw Rd., Clinton, NC 28328; Corbitt Marshburn, (919) 592-9489



Granite City R/C Raceway, 192-1 N. Main St., Mt. Airy, NC 27030; (919) 786-1466



Hi-Performance Hobbies & R/C Raceway, P.O. Box 320, Earl, NC 28038; Derrell Hollifield, Steve Bliss, (704) 482-4391



Hobbies Unlimited & R/C Speedway, 385 W. Grover St., Shelby, NC 28150; Robin Bowman, (704) 482-8533



Hobby Park, W. Clemmons Rd., Winston-Salem, NC 27103; Dick Butler, Parks & Recreation, (919) 727-2063



The Hobby Speedway, Hwy. 25, P.O. Box 279, Naples, NC 28760; Jerry or Kelda Bowers, (704) 684-9814



Jacksonville International Speedway, Hwy. 17N, Jacksonville, NC 28540; (919) 346-1522



Joe's Hobby Shop & Raceway, Rt. 2, Box 682-B, Bessemer City, NC 28016; (704) 435-2912



Motorhead R/C Raceway, 125 Park St., Canton, NC 28716; (704) 648-7911



Mountain R/C Raceway, Hwy. 107N, P.O. Box 67, Glenville, NC 28736; (704) 743-3709



Reedy Creek Raceway, Rt. 14, Box 946, Conard Sowers Rd., Lexington, NC 27292; (704) 731-4022



Sandhills Raceway Inc., US #1 South, Aberdeen, NC 28315; (919) 944-7414



Smiley Face Raceway, 120 W. Center St., Mebane, NC 27302; (919) 563-3822



TLC R/C Raceway, Rt. 6, Box 321-A, Hwy. 601, Mocksville, NC 27028; (704) 492-7569



TNT R/C Raceway, 707 N. Salisbury Ave., Salisbury, NC 28159; Larry Martin, (704) 633-0647



NORTH DAKOTA

Basin R/C Raceway, Basin Hobbies, 2124 2nd Ave., W., Williston, ND 58801; Shawn Wyse, (701) 774-3634



Crystal Springs Off-Road, 1200 53 Ave. SW, Minot, ND 58701; (701) 852-9590



OHIO

Alcraft's R/C Raceway, 1370 Custer-Orangeville Rd., Brookfield, OH 44003; (216) 448-1573



American Raceway, 234 Robbins Ave., Niles, OH 44446; George Nikoloff, (216) 544-5455



Bryan Thunderdome, Townline Rd., Bryan, OH 43506; Jeff Lehmann, (419) 636-9100



Classic Hobbies & Raceway, 2845 W. Waterloo Rd., Akron, OH 44312; (216) 628-3222



C/R Hobbies/Top Race Track, 4914 Main Ave., Ashtabula, OH 44004; Charles Jones, (216) 992-3833



D&J R/C Raceway, 801 W. Market St., Orrville, OH 44667; Don Yoder or Mark Nussbaum, (216) 682-4266



D&S Hobbies Raceway, 7701 Crile Rd., Concord, OH 44077; (216) 354-2112



Duke's Hobby/Canton R/C Speedway, 2600 17th St. SE, East Canton, OH 44730; Mike Duke, (216) 453-4065



Golden Bear Hobbies, 154 N. Millbourne Rd., Orrville, OH 44667; Bob Rodi, (216) 683-1250



Hi-Tech Hobbies II, 116 Taylor St., Loveland, OH 45140; Rick, (513) 683-8900



Hobby Mania Raceway, 6597 Route 224, Lowellville, OH 44436; (216) 536-8282



Innovative Hobbies/Lakeside Speedway, 3427 Manchester Rd., Akron, OH 44319; (216) 645-1333



KAR R/C Raceway, 14511 Seacrest Rd., Salem, OH 44460; (216) 537-4039



Mid-Ohio R/C Raceway, 5367 Fishburg Rd., Huber Heights, OH 45424; (513) 233-2807



Paulding R/C Speedway, 103 N. Main, Paulding, OH 45879; Virgil Simindinger, (419) 238-0633



The Racer's Choice R/C Hobbies & Raceway, 1298 US Rt. 42, Mason, OH 45040; (513) 398-5539



Right Choice Hobbies, 7760 Garrison Ave., Cincinnati, OH 45247; (513) 353-3343



Strongsville Speedway, 13315 Prospect Rd., Strongsville, OH 44136; (216) 572-0430



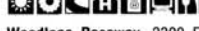
Trusso's R/C Raceway, 100 W. Crain Ave., Kent, OH 44240; Bill, (216) 673-0422



Turn 4 Hobbies, 112 W. Main St., Van Wert, OH 45891; Virgil, (419) 238-6840



Way Out Hobbies, 5583 Centerpoint Rd., Georgetown, OH 45121; (513) 375-4984



Woodlane Raceway, 2300 E. Dorothy Lane, Dayton, OH 45420; Jeff Simpson, (513) 298-1166



Y-City Hobby & Speedway, 120 S. 6th St., Zanesville, OH 43701; Kevin McKenna, (614) 455-3025



OKLAHOMA

Off-Road Car Assoc. of Tulsa, 1924 W. Pittsburg Ct., Broken Arrow, OK 74012; Mark Seay, (918) 496-8961



OKC Raceway, 6707 NW 10th, Oklahoma City, OK; (405) 495-4820



RCRC of Oklahoma, 400 S. Vermont, Ste. 104, Oklahoma City, OK 73108; Robert Jones, (405) 942-RCRC



Wild Country Speedway, 127 South Main, Porter, OK 74454; Charles McCollough, (918) 483-8111 or 687-1686



Wings & Things, 5241 S. Peoria, Tulsa, OK 74105; Dave Hendon, (918) 745-0034



OREGON

Ed's Dirt Speedway, 2809 N. Cherry St., La Grande, OR 97850; (503) 568-4332



The Finish Line R/C Raceway, 560 W. 'D' St., Apt. 6, Creswell, OR 97426; Rod Carothers, (503) 895-4395



ML Bachelor Radio Raceways, 225 Centruy Dr., Bend, OR 97701; Rex Baldwin, (503) 389-6160



R/C Plus Hobbies Raceway, 2029 25th St. SE, Salem, OR 97302-1130; Ron Smith, (503) 364-9188



R/C Speed Center, 2810 N. Pacific Hwy., Medford, OR 97501; (503) 779-8298



Thunder Road, R/C Hobbies, 1624 Williams Hwy., Grants Pass, OR 97527; (503) 479-8701



Yamhill County R/C Car Club, 722 Morgan Ln., McMinville, OR 97128; Larry Rucker, (503) 472-7234



PENNSYLVANIA

A-1 R/C Speedway, 15 S. Hanover St., Hummelstown, PA 17036; Clyde Felker, (717) 566-3335



Ansolan, 54 High St., Fairchance, PA 15436; Timothy Abraham, (412)

Track Directory

New Garden Farms/Mushroom Bowl, 812 W. Cypress St., Kennett Square, PA 19348; Drew Pannell, (215) 444-1850



Performance Hobby, 1305 Main St., Slatington, PA 18080; (215) 760-9855



Phantom, 1520 Montrose, Philadelphia, PA 19146; (215) 545-3769



Pit Stop Hobbies, 262 W. Main St., Mount Joy, PA 17552; James F. Stovot Jr., (717) 653-6222



Pro Challenge Raceways, Wycombe Ave. (P.O. Box 536), Lansdowne, PA 19050; Bob Baldwin or Bob Paulauge, (215) 622-7651



Prop & Wheels Raceway, 139 W. Broadway, Tamaqua, PA 18252; (717) 668-2288



Race Place Hobbies, 201 Station Rd., Quakertown, PA 18951; (215) 538-2394



Radio Controlled Pro Speedway, 487N, Stillwater, PA 17878; (717) 387-0266



Riverside Raceway, PA Ave. W & Hickory, Warren, PA 16365; Jeff, (814) 723-4211



Rolling Wheels, West Hills Shopping Center, Coraopolis, PA 15108; Peggy, (412) 262-4858



S.A. High Banks, RD #1, Palmerton, PA 18071; Bruce Laub, (215) 377-6123



T&T Radio Controlled Racing, Randolph Rd., Great Band, PA 18821; (607) 723-9357



TC's R/C's, 1537 Freepport Rd., Natrona Heights, PA 15065; Tom Coriale, (412) 226-8802



Trains and Lanes, 3812 Newburg Rd., Easton, PA 18042; Jeff Setzer, (215) 253-8850



TV Superspeedway, 492 Jane Dr., Plum Borough, PA 15239; Bill Smith, (412) 795-5914



Wagonhill Hobbyland, RD 3, Box 183, Slippery Rock, PA 16057; (412) 458-4711



RHODE ISLAND

East Bay Hobbies, 629 Metacom Ave., Bristol, RI 02809; (401) 254-0778



R/C Hobbies, 47 Sandybottom Rd., Coventry, RI 02816; (401) 823-4335



SOUTH CAROLINA

Bandits Performance R/C Hobbies, P.O. Box 1533, Darlington, SC 29532; Bryan Howle Jr., (803) 393-3333



Berea R/C Speedway, 707 Sulphur Springs Rd., Greenville, SC 29611; (803) 246-4702



Inland R/C Speedway, 61 Newfound Lane, Myrtle Beach, SC 29577; James Watten, (803) 293-1753



LB Co. Hurricane, 112 Green Acres Rd., Blythwood, SC 29016; (803) 786-0984



Mid-Carolina R/C Superspeedway, 2222 Wintercrest Dr., Rock Hill, SC 29732; Fred Penland, (803) 328-8278



Monaco's Raceway, 727 E. Buena Vista Ave., N. Augusta, SC 29841; Bill Lounson, (803) 279-8982



Palmetto Raceway, 5023A Rivers Ave., N. Charleston, SC 29418; (803) 566-0068



TBS Superspeedway, Hwy. 151, Darlington, SC 29532; (803) 395-1551 or 332-7117



TBS Superspeedway, 800 Hwy. 15N, Hartsville, SC 29550; Johnny Tiller, (803) 332-7117



Thunder Valley R/C Speedway, 432 E. Church Rd., Easley, SC 29642; (803) 859-2323



SOUTH DAKOTA

Flags of Fun R/C Raceway, 2802 Eglin St., Rapid City, SD 57702; Rex Conrad or Scoop Caskowski, (605) 341-2186



Dakota Off-Road Racers, 2989 W. Br. Co. 12, Aberdeen, SD 57401; (605) 226-0604



TENNESSEE

Crash-n-Burn R/C Raceway, 7030 Maynardville Pike, Knoxville, TN 37918; Gary Daniel, (615) 922-8722



Competition Park, Rt. 10, Box 268, Crossville, TN 38555; Terry or Yvette Bowen, (615) 277-5048



D&M's Downtown Raceway, 8 North White St., Athens, TN 37303; (615) 745-4288



The Dirt Dome, 575 W. Poplar Ave., Memphis/Collierville, TN 38017; (901) 853-3428



Lail Speedway, 812 Wells Rd., Maryville, TN 37801; Jack or Chris, (615) 983-9207



MSA R/C Racing, Rt. 12, Box 489B, Crossville, TN 38555; D.R. Findley, (615) 456-0027



Tuckasee Off-Road Raceway, 1104 Lafayette Rd., Clarksville, TN 37042; (615) 645-2635



TEXAS

AA Raceway, 1617 Toomey Rd., Austin, TX 78704; (512) 474-8277



Anchored Acres Raceway, 1101 Sheppard Rd., Burkburnett, TX 76354; Bob & Patricia Veal, (817) 569-4707



Austin R/C Center, 9702 Gray Blvd., Austin, TX 78758; Caton Cobb, (512) 832-8144



Budget Raceway, RR 1, Box 400 I-35, Bruceville, TX 76630; (814) 859-5296



Checkered Raceway, 8100 Kirkwood, Houston, TX 77072



Competition Hobbies Raceway, 309 W. Hwy. 190, Copperas Cove, TX 76522; Larry Gholson, (817) 547-7505



Eagle Hobby Center, 3601 Shepherd, Balch Springs, TX 75180; Terry Cooke, (214) 557-5290



Eastex Raceway, 45000 Hwy. 59, New Caney, TX 77357; Heinz Falke, (713) 399-1527



Finish Line Hobby Store & Raceway, 11925 Jones Maltzberger, San Antonio, TX 78016; (512) 491-0088



Hal's R/C Raceway, 1440 Bessemer, El Paso, TX 79936; (915) 591-2213



Hi-Tech Hobbies & Raceway, 1107 Port Neches Ave., Port Neches, TX 77651; (409) 724-2315



Indy R/C World, 220 Mesquite Village, Mesquite, TX 75150; (214) 686-7744



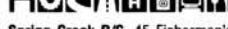
J&K Speedway, 201 Enterprise Row, Suttie 101, Conroe, TX 77301; J&K Hobbies, (409) 760-1986



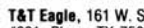
Norm's R/C Hobbies & Raceway, 2551 Lombardy, Ste. 160, Dallas, TX 75220; Norm Mazzola, (214) 357-3453



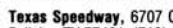
R/C Pro Shop, 12207 West County Road #129, Odessa, TX 79665



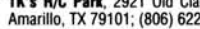
Spring Creek R/C, 45 Fisherman's Rd., San Angelo, TX 76904; (915) 944-3850



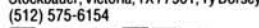
T&T Eagle, 161 W. Spring Creek Pkwy., #601, Plano, TX 75023; Tony Welborn, (214) 517-0562



Texas Speedway, 6707 Chimney Rock, Bellaire, TX 77401; (713) 661-7137



TK's R/C Park, 2921 Old Claude Hwy., Amarillo, TX 79101; (806) 622-0017



Ty's Toys & Raceway, 129 John Stockbauer, Victoria, TX 77901; Ty Dorsey, (512) 575-6154



Wes Hobby, 980 S. 4th St., Beaumont, TX 77701; Edmond Richards, (409) 839-4929



Wild Bill's, 535 E. Shady Grove, Irving, TX 75060; Lynn Morgan or Jerry Williams, (214) 438-9224



Z Track, 1550 Dunnam Dr., Abilene, TX 79602; Chi Chi, (915) 692-8477



UTAH

Hansen Intermountain R/C Raceway, 8481 W. 2700 S., Magna, UT 84044; Kevin Hansen, (801) 250-8303



W.O.R. Raceway, 30 Brinker Ave., Ogden, UT 84401; IRCORA, (801) 773-0933



VERMONT

Barre Town R/C Club, Wall St. Complex, S. Main (Rt. 14), Barre, VT 05641; Russ Tribble, (802) 888-2860



Bradford R/C Racing, Fairgrounds Rd., Bradford, VT 05033; Rodney Sherburne, (802) 222-9224



Mike's Hobbies & Raceway, 162 N. Main St., Rutland, VT 05701; Stephen Rachlis, (802) 775-0059



Silver Towers Raceway, Elks Club, North Ave., Burlington, VT 05401; (802) 658-4490



VIRGINIA

A-1 Raceways, 940 Radford Rd., Christianburg, VA 24703; Kay or Charles Franks, (703) 382-1173



Bob's Hobbies & Raceway, 910-J Brandy Creek Dr., Mechanicsville, VA 23111; Bob Wagner, (804) 746-2758



Cooper's R/C Raceway, Rt. 4, Box 12203, Chatham, VA 24531; (804) 724-4182



Crossroads Hobbies R/C Raceway, 1104 W. Main St., Salem, VA 24153; Ronnie Black, (703) 387-3414



Dad's Day Off Model Speedway, Rt. 460, National Dr., Blacksburg, VA 24060; Alan Duffy or Dave Schuh, (703) 633-0236



Front Royal R/C Racing Association, Chester St., P.O. Box 1252, Front Royal, VA 22630; Roger Stoots, (703) 636-2637



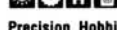
H&S R/C Raceway, 565 Electric Rd., Salem, VA 24153; Henry Dowd or Stacy LaPrade, (703) 343-4012



Lane's End Raceway, P.O. Box 153, Bridgewater, VA 22812; Tony Strother, (703) 828-6655 or 3471



Mid Atlantic Raceway, 89 E. Elizabeth St., Harrisburg, VA 22801; (703) 433-3952



Precision Hobbies & Raceway, 4000 Mechanicsville Tpke., Richmond, VA 23223; Larry, Don, Chance, (804) 329-8051



Sterling Truck & Auto Racers, 20921 Davenport Dr., Sterling, VA 22170; Ron Beckman, (703) 444-0333



The Tilt-yard, Rt. 1, Box 235A, Dayton, VA 22801; Homer W. Allman Jr., (703) 828-3471 or 828-6655



Trainland R/C Club, 5661 Shoulders Hill Rd., Suffolk, VA 23435; Frank Stevens, (804) 483-2331



Westpoint Hobbies, 3180 King William Ave., Westpoint, VA 23181; (804) 843-4933



Winners Circle, 3236 W. Clay St., Richmond, VA 23230; (804) 355-7076



WASHINGTON

Alfie's, 108 South K St., Aberdeen, WA 98520; (206) 533-6638



Arlington Heights Speedway, 13629 228th St. NE, Arlington, WA 98223; Shawn Bussert, (206) 435-3442



Firgrove TNT Raceway, 10611 136th E., Puyallup, WA 98374; Walt Hale, (206) 845-7675



Four Seasons R/C Racing, 146 School St. SE, Olympia, WA 98506; (206) 491-2430



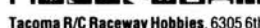
Hank Perry Race Complex, Sullivan Rd., WA 99213; (509) 927-1879



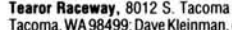
NORA Performance R/C, P.O. Box 955 (1673 Cedarvale Rd.), Mt. Vernon, WA 98273; (206) 755-9464



Spokane Indoor Raceway, E. 6422 2nd Ave., Spokane, WA 99212; Mike Gjendern, (509) 534-RACE



Tacoma R/C Raceway Hobbies, 6305 6th Ave., Tacoma, WA 98406; (206) 565-1935



Tearor Raceway, 8012 S. Tacoma Way, Tacoma, WA 98499; Dave Kleinman, (206) 584-8659



WEST VIRGINIA

Fairmont R/C Raceway, 430 Fairmont Ave., Fairmont, WV 26

Hobby World Speedway, 3198 London Rd., Eau Claire, WI 54701; (715) 834-0456



JJ's Dirt Heaven, 6028 County K, Champion, WI 54229; (414) 866-9096



Maniac Motors Raceway, 244 Rt. 1 A1 Rt. H, Kendall, WI 54638; (608) 847-4833



MARCCA Raceways, 1810 S. Park St., Madison, WI 53713; Jeff Gundlach, (608) 273-0519



Midwest Tri-Clone, 144 N. Main St., West Bend, WI 53095; (414) 334-0487



Muskyland R/C Raceway, P.O. Box 1043, Hayward, WI 54843; Hayward R/C Wheels Club, (715) 462-3312



Pacific R/C Club, W7990 Hwy. P, Pardeeville, WI 53954; Rhys Brenner, (608) 742-7100



The Pits Hobby Shop, 786 Morris Ave., Green Bay, WI 54304; (414) 494-4200



R/C Hobby Off-Road Track, Lewison Lane, Viroqua, WI 54665; Dan or Diane Sawvell, (608) 637-8221



R/C Raceways & Hobbies, 181 W. Marquette Ave., Oak Creek, WI 53154; Ralph & Cathy Augustino, (414) 764-9701



R/C Spectacular, Milwaukee Mecca Auditorium, c/o Wisconsin Motorsports Show, 11020 W. Rogers, Milwaukee, WI 53227; (414) 327-3999



Radio Mania, 129 Harrison St., North Prairie, WI 53153; Bill Bowes, (414) 392-9515



Skipper Bud's Speedway, 1608 River Dr., Stevenspoint, WI 54481; Skip Theroux, (715) 344-5919



Sparta R/C Raceway, Golf Course Rd., Sparta, WI 54656; Eric Johnson, (608) 269-5861 or 269-6613



Stoltz Raceways, 548 Summit Dr., West Bend, WI 53095; (414) 338-6097

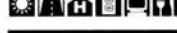


West Bend Hobbies, 144 N. Main St., West Bend, WI 53040; (414) 334-0487



BRAZIL

Hobby Center, SQS.210 BLH Apt. 204, Brasilia, DF-Brasil 70.273.061-242-0488



CANADA

Aprilia Track, 20 Parsons Ridge, Kanata, Ontario K2L 2N4; (613) 836-2577



Autodrome des Laurentides, 1003 Rue Lauzanne, Bellefeuille, Quebec J7Z 5L8; Jean-Marc Morin, (514) 431-7241 or 438-0907



Autodrome des Prairies, 935 Boul. St-Luc, St-Luc, Quebec J0J 2A0; (514) 348-0718



Autodrome Sher-Hobby, 1035 Panneton, Sherbrooke, Quebec; (819) 820-1151



Cantraxx Raceway, 8876-48 Ave. SE, Edmonton, Alberta T6E 5L1; (403) 469-9193



Circuit R/C Bonzai, 164 Cowie, Granby, Quebec J2G 3V3; (514) 372-3622



Circuit St-Denis Auto Téléguides, 292 DuLion, St-Denis sur Richelieu, Quebec, J0H 1K0; Francois Rivard, (514) 787-1127



Crash Course, Box 9, Site 8, RR #1, Spruce Grove, Alberta T7X 2T4; Tim Starrevied (403) 963-5795



CRCO, 4565 Bh St-Joseph Drummondville, Quebec J2A 1B4; Jacques Lefebvre, (819) 474-4001



GRSCR, 9 Gauthier, St-de L'Achigan, Quebec J0K 3H0; (514) 588-4254



Honda House Motor Speedway, 384 Richmond St., Chatham, Ontario N7M 1P9; (519) 354-5530



J-T International Raceway, 127 Milligan Ln., Napanee, Ontario K7R 8A1; (613) 354-0099



Quintrax Speedway, Box 1034, Belleville, Ontario, K8N 5B6; (613) 962-1414; fax: (613) 962-7306



Rousillon Hobby Track, 177-D St-Jean Baptiste, Chateaugay, Quebec J6K 3B4; (514) 698-2151



Universal R/C Speedway, Niagara St., Welland, Ontario; (416) 735-5051



JAPAN

Misawa R/C Raceway, 13th Fighter Squadron, PSC 76, Box 2585, APO AP 96139-2585; 011-81-176-53-5181, ext. 226-6506



MEXICO

Hobby's Formula, Au observatorio 457, Mexico DF 01120; (905) 502-3620



R/C Baja Rosarito, Paraiso Ranch, Rosarito Beach, Baja California; 011-526-612-0495



SPAIN

ROARCR, Naval Station, Rota, Spain (P.O. Box 53, FPO NY, NY 09540-0013); PO Kelly Sexton, 011-34-56-822652



ZIMBABWE

Mosi-Oa-Tunya, H9619 Highland Harare, Harare Country, Maslroland, Zimbabwe; 46237



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- Outdoor
- Off-road
- Oval
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- Concrete
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- On-site hobby shop
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- Automatic lap-counting
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| ☐ Outdoor | ☐ Asphalt |
| ☐ Off-road | ☐ On-site hobby shop |
| ☐ Oval | ☐ AC power |
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STORM

(Continued from page 108)

lightweight construction and suspension geometry. The Storm is easy to assemble, durable, and it can hold its own in the rough-and-tough truck-racing class.

*Here are the addresses of the companies mentioned in this article:

Schumacher Inc., 6302 Benjamin Rd., Ste. 404, Tampa, FL 33634.

Dude Inc., P.O. Box 31266, Amarillo, TX 79120.

LRP, distributed by Schumacher.

Associated Electronics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

Airtronics Inc., 11 Autry, Irvine, CA 92718.

Sanyo Electric, Battery Division, 200 Riser Rd., Little Ferry, NJ 07643. ■

TRUCK OF THE YEAR

(Continued from page 126)

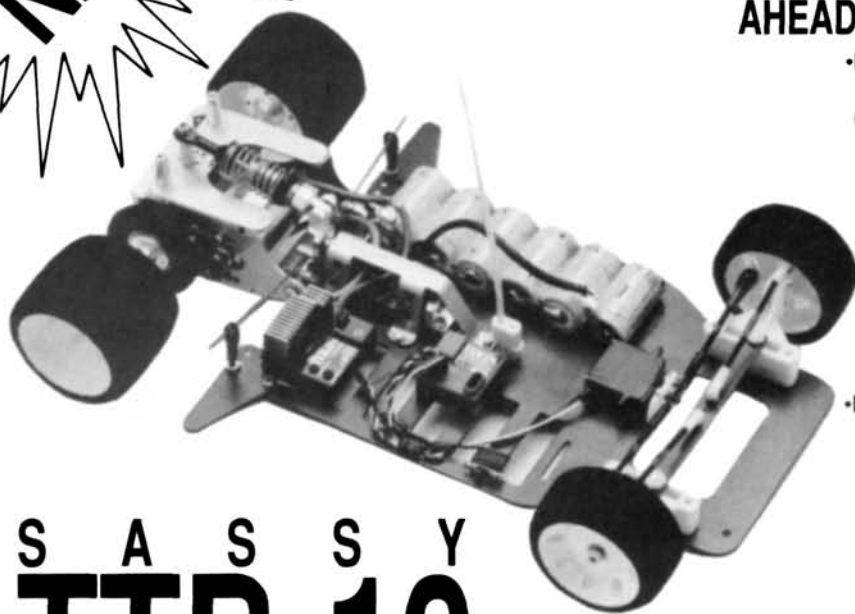
As if these features weren't enough, the RC10T also comes with the light Stealth tranny—probably one of most significant R/C developments in the last 5 years. It has a low rotating mass, and it uses 48-pitch gears, carbide diff balls and a Rulon clutch plate for long life and low maintenance. It can withstand the abuse of today's high-

(Continued on page 192)



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TRUCK OF THE YEAR

(Continued from page 152)

torque motors and high-powered batteries.

The most awesome part in this kit is the rubber—not! The stock rear tires are fine for most applications, e.g., super-soft sand pits. For racing on hard clay surfaces, however, try a set of Pro-Line* wide fronts and spiked rears. To improve traction on high-bite tracks, these really can't be beat!

TUNEMEISTER—A QUICK TEST

No exaggeration here—right out of the box, this truck does *not* disappoint! I only had to switch from 30WT to 40WT silicone oil, and the 10T found its footing. I also replaced the stock 15-degree caster blocks with 25-degree blocks, and this greatly increased the truck's steering. (Beginners beware; there's a lot of steering built into this truck.)

Associated made the RC10T available only after it had won several major race titles, e.g., the Florida Winter Champs, the NORRCA Nats, the Monster Mash and the Western Off-Road Champs. With a win list as impressive as this, it's no wonder that the long-awaited 10T was an instant success.

The 10T is well on its way to winning over the majority of the trucking public. Gone is the banter and the rhetoric from lesser-known, lesser-shown competitors. After a clean campaign, Associated's well-designed, reliable, versatile RC10T really has *earned* its title of Truck of the Year.

**Here are the addresses of the companies mentioned in this article:*

Associated Electronics Inc., 3585 Cadillac Ave., Costa Mesa, CA 92626.

Pro-Line USA, P.O. Box 456, Beaumont, CA 92223.

Tekin Electronics, 970 Calle Negocio, San Clemente, CA 92672.

Reedy Co.; distributed by Associated Electronics Inc.

Airtronics Inc., 11 Autry, Irvine, CA 92718. ■

RADIO REVIEW

(Continued from page 48)

to the left or right of the center point. For example, you could adjust the R-756 so that your servo moves only 40 percent of its range to the left, yet it still has full travel to the right. This helps you to tailor your steering servo to your car's steering system, and it prevents the servo from straining against the linkage when the linkage's travel limits are reached.

• **Steering and throttle curve.** This is your steering exponential-rate adjustment. Normally, your radio's steering would be linear, i.e., its movement parallels that of your transmitter. On the R-756, this would be 0 percent. By using the exponential rate, you can alter the percentages for this value (plus or minus in 1-degree increments, with 100 percent being the maximum). For example, at minus 100 degrees, your steering would move very slowly (in relation to your transmitter) from the center point, and it would gradually regain its linear status as maximum travel is reached.

The R-756 also provides this function for the throttle channel, which allows you to alter the throttle characteristics of your model in much the same way that the steering curve is altered.

OVERVIEW

I've raced with the R-756 for a few months now, and I've found that the more I become familiar with its features, the more I like it. Initially, even the most experienced racers will be a little overwhelmed

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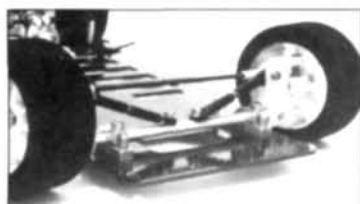
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▼ Aluminum Lazer Parts 	▼ Shock Towers & Limiters 	▼ RC-10 Intruder Body 	▼ Monster Truck Accessories 

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For Catalog send \$2.00, Canada - \$2.50 in U.S. Funds, Overseas - \$3.50 in U.S. Funds. Sticker Sheets are available in fluorescent pink, yellow or blue - \$1.25 ea. T-Shirts are available in two colorful styles in S, M, L, XL, & XXL. A&L Rear End - \$10.65 ea., Power Clutch/Lethal Weapon - \$11.95 ea. Please add shipping of \$3.50 for 1-3 shirts. CA residents add 7.75% sales tax. Mail to A&L Manufacturing, P.O. Box 2115, Corona, CA 91718

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RADIO REVIEW

by this radio, but as they progress, they'll be asking themselves how they ever managed without all of the R-756's features.

The case is identical to one of my all-time favorite ergonomic radios—the KO Propo EX-5—so driving is comfortable. The lap timer is great, however, operating it with the thumb button takes more effort than it should. I may add a small plate to the button to extend it a little. I use this feature often during practice, so I can accurately gauge my performance to that of other racers before my first qualifier. Also, I now know if any changes I make to my car's setup during practice are beneficial or detrimental to its performance.

On the downside, I found that operating

some of the controls—in particular the keypad—was a little difficult. For example, to initiate some functions, you have to depress two buttons simultaneously. If this is done incorrectly (and this can happen under stressful race circumstances), you can become frustrated.

Even though my particular R-756 came only with the PPM receiver (the PCM receiver was, at this time, unavailable), I've yet to experience glitches of any kind. This, combined with the trim alarms, makes you feel very secure and instills confidence on the drivers' stand.

If you're in the market for a top-of-the-line FM radio, you could do worse than the R-756. This radio won't make you drive better, but the fact that it can help you fine-tune your car and your driving

makes it very useful. It definitely deserves a thumbs-up rating!

**Here's the address of the company that's featured in this article:*

JR Propo Remote Control; distributed by Hobby Dynamic Distributors, P.O. Box 3726, Champaign, IL 61826. ■



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WHAT'S NEW



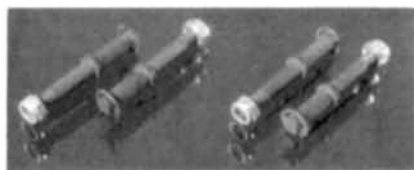
THUNDERBOLT Glow Plug

After two years of R&D, Thunderbolt has released its newest glow plug—the Thunderbolt No. 3. It develops a hotter glow, partially because of its expensive, custom-wound, platinum-alloy coil element. Its large heat-sink area and its nickel-plated body provide excellent heat transfer.

Part no. 115559

Price: \$7.50

Global Hobby Distributors, 10725 Ellis Ave., Ste. E, Fountain Valley, CA 92728.



PSE Pro-Stub Axles

PSE's new pro-stub axles for 1/10- and 1/12-scale cars have built-in washers that ride against the bearings' races and prevent binding. The axles are made of a strong, hardened-steel material.

Part no. 95060

Price: \$3.50

Parma International Inc., 13297 Progress Pky., N. Royalton, OH 44133.



CHICAGO MODEL INTERNATIONAL Tracks

Chicago Model International now offers a line of affordable, ready-to-run "tracked" vehicles. Three models are available—the M1A1 Abrams tank, the Chevy Blazer van and the Ford Ranger Truck—and you can order them with or without a radio system installed. Prices range from \$79 to \$159, depending on the equipment included.

Chicago Model International, P.O. Box 170, Deerfield, IL 60015.



PARMA Hemi Vette Kit

Parma's 1/10-scale Hemi Vette has a five-piece '58 Lexan Vette body with full valence panels in the front and the rear, a complete Lexan "underchassis," and a motor compartment with a radiator, a firewall and inner fenders. It's the perfect showcase for the gleaming Hemi engine. The kit also includes a rolling chassis and extra-wide rear wheels with factory-mounted tires. An "invisible" body-mount system eliminates unsightly hood pins.

Part no. 10366

Price: \$139.95

Parma International Inc., 13297 Progress Pky., N. Royalton, OH 44133.



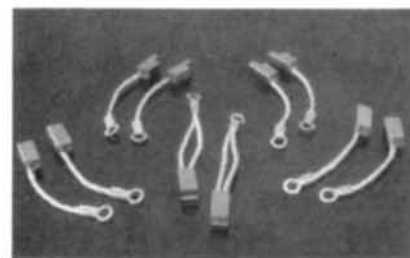
DURATRAX CZ-R Tuned Exhaust System

The .12 CZ-R tuned exhaust system is a high-performance replacement for the stock mufflers used on the Kyosho Rampage, the Outlaw Rampage, the Corvette ZR-1 and the Thunderbird. This efficient unit is perfect for use with a DuraTrax CZ-R slide-valve carb and heat-sink head. The tuned-pipe has a bright, blue-anodized finish.

Part no. DTXG1100

Price: \$64.95

Great Planes Model Distributors, 1608 Interstate Dr., Champaign, IL 61821.



PARMA Motor Brushes

Want to modify your plan of attack? Try using Parma's silver-compound motor brushes. Their double-shunt wire provides your motor with maximum power flow and, like Parma's high-graphite Power brushes and low-graphite RPM brushes, they're available in full or timed versions.

Parma International Inc., 13297 Progress Pky., N. Royalton, OH 44133.



HOBBICO Bullet CA Gel

Hobbico's thick Bullet CA gel won't run, drip, or spill. You can use it for any application that requires CA; it's perfect for joint reinforcements and fillets. The gel works well on all surfaces, especially plywood and balsa, and its convenient, no-spill aluminum tube makes applying it a breeze—from any angle!

Part no. HCAR3450

Price: \$8.99

Great Planes Model Distributors,
P.O. Box 9021, Champaign, IL 61826.



TEKIN 610-R

The 610-R is Tekin's newest speed controller with reverse. It handles 6- to 10-cell battery packs, and it has fully proportional forward, reverse and brakes. To determine when reverse will activate after you apply the brakes, just set the unit's built-in time-delay from 0 (for instant response) to 5 seconds. The 610-R also has ultra-powerful Megafet transistors, thermal-overload protection, high-frequency operation and 15-gauge wire to handle hot modified motors.

Price: \$165

Tekin Electronics, 970 Calle
Negocio, San Clemente, CA 92672.



BUD'S RACING PRODUCTS Bud's Racing Oil

This secret blend of additives and high-quality synthetic lubricants works extremely well on ball bearings and bushings. It was used in the fastest R/C cars at the '91 Thunderdrome race!

Part no. 7470

Bud's Racing Products, 1575 Lowell
St., Dept. RCCA, Elyria, OH 44035.



BOLINK Quick-Change Conversion Kit

Bolink now offers quick-change conversion kits for the RC10L SS and the Lynx II SS. Both kits are designed to accommodate 6-cell stick packs, and each comes with a complete hardware package, a special chassis that's perfect for endurance racing, three sets of battery contacts and instructions.

Part nos. BL-5080 (RC10L SS); BL-5081 (Lynx II SS).

Price: \$89.95

Bolink, 420 Hosea Rd., Lawrenceville, GA 30245.



BUD'S RACING PRODUCTS Bud's Racing Wraps

These futuristic sunglasses/goggles are sure to be a hit on the drivers' stand! They effectively block UV rays, prevent glare and keep dirt out of your eyes. You can wear them over prescription glasses (one size fits all), and they're available in several colors. (Dark colors are best for bright sunny days; light colors for cloudy conditions or dusk.)

Part nos. 7900 (smoke); 7901 (brown); 7902 (neon yellow); 7903 (hot pink).

Price: \$10.50

Bud's Racing Products, 1575 Lowell
St., Dept. RCCA, Elyria, OH 44035.

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